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Users Mull Charging Unbundled Firms for Debugging

By Peter L. Briggs
CW Technical Research Editor

Users of several large sites with OS/360 are now experiencing more system problems after IBM's unbundling. The problems are mostly of software failure or inadequately debugged software.

Before unbundling, IBM maintained certain sites as "Beta-Test" installations. These selected centers received the newest release of software before the general release and were expected to offer feedback on problems encountered in using or implementing the software.

In recompense, IBM would staff the sites with technical experts who could offer rapid solutions to problems encountered and could document the problems for a repair in the official system release. The repairs made were called "Product Temporary Fixes (PTFs)" and would be included with the formal release of that version of the operating system.

More Bugs Now

With unbundling, however, IBM has been forced to stop this practice. The consensus of interviews with eight of the largest DP center managers is that users now can get operating systems and other software with more bugs in it because of the bypassed shakedown period.

All software developers have long recognized that there is no better test of a new package than on-site operation.

The problems that occur mostly result from users trying things that are perfectly legal according to the published documentation, but which are not properly handled.

With OS, the list of problems might run into the hundreds on the first 10 releases.

Unbundling and user awareness of manufacturer attitudes are bringing about a new situation. One of the sites interviewed was a large university with extensive equipment installations and large volumes of production work. This university said it intended to begin negotiating an arrangement whereby it can be paid back for the work and the time spent debugging a manufacturer's software.

The data center manager believed his people are spending about 5% of their time, and about 8% of the machine time, trying to get certain pieces of software working.

He also maintained that if a manufacturer is going to charge him for the time its personnel spend working on his systems, that he could charge the manufacturer for similar work on the manufacturer's systems.

This particular center manager does not have too much

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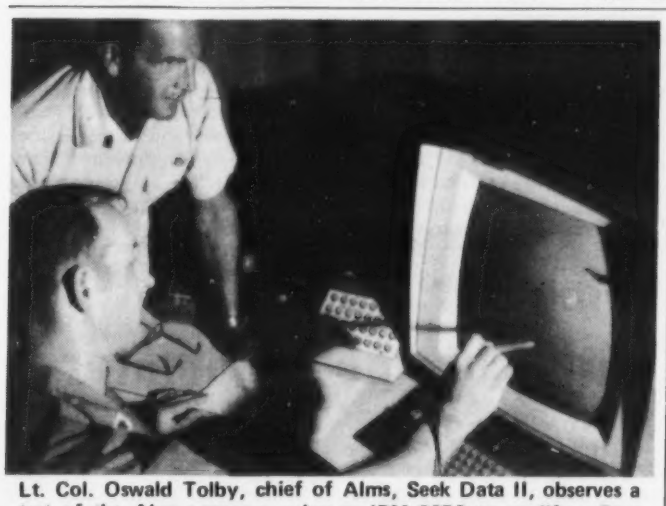

Lt. Col. Oswald Tolby, chief of Alms, Seek Data II, observes a test of the Alms program, using an IBM 2250 to modify a Frag prepared by computer.

Computers at War

AF DP Role 2-Sided

By Bernice Pantell
Special to Computerworld

SAIGON – The Air Force uses computers for research and development as well as for practical applications in Vietnam. Unfortunately, the R&D program isn't "scheduled."

7th Air Force personnel describe their complex computer system for preplanning air strikes and airlifts as an ongoing system, but they are either kidding the public or themselves.

As an R&D project, preplanning aircraft by computer is interesting and may have great potential. But as an operational reality, at least in Vietnam, it is a flop so far.

This project is known by the buzz name of Seek Data II. Spokesmen at Tan Son Nhut Air Base in Saigon, headquarters for 7th Air Force, are wildly enthusiastic about Seek Data II and what they consider to be its enormous computer power. The story behind this enthusiasm is somewhat less impressive.

Originated in Hawaii

Seek Data II originated more than two years ago in Hawaii under Pacific Air Foce (Pacaf). The Air Force signed a contract with Control Data Corp. to do the analysis, design and programming, sort of as a test case to see whether the software could be developed faster on the spot where the need exists rather than through normal central control channels.

Seek Data II was presented to CDC in three segments. One segment would provide for preplanning air strikes (selecting targets, determining ammunition, fuel and personnel requirements, etc.) and printing the document used to schedule the aircraft, known universally as the Frag (a fragment of the operational order).

This segment is called Frag Prep. The second segment would perform airlift management, scheduling the movement of cargo and personnel by computer and producing the Frags for airlift control.

This segment is called Alms (airlift management system). The third segment would provide reporting and evaluation from the operating level up

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Updated RCA TSOS Said to Give 70/46 User Increased Efficiency

By Don Leavitt
CW Staff Writer

CHERRY HILL, N.J. – An updated version of RCA's Time-Sharing Operating System (TSOS) is said to give users of the Spectra 70/46 four times the performance of previous TSOS packages.

According to RCA, TSOS-Version 6 is the most comprehensive software package of its type ever developed. The company claims that it brings the capabilities that RCA, and other mainframe manufacturers, have been trying to build into time-sharing systems for years.

An expanded version of TSOS-Version 6 will be made available to users of the larger 70/61 systems later this year, the company added. (RCA is expected to announce new equipment this week.)

Adding remote batch processing to capabilities previously available, TSOS-Version 6 provides an operating system for simultaneous local and remote batch, interactive and transaction data processing.

As with earlier RCA time-sharing packages, TSOS-Version 6 makes use of a virtual memory concept built on a 262K (64 pages of 4,096 bytes each) physical memory and a paging drum (backing store) having a transfer rate of 333 kilobyte/sec and a capacity of either 800 or 1,600 pages.

The new operating system includes such features as a redesigned data management system, Version III Fortran and Cobol compilers, additional utility routines, spooled-in remote terminal input, and Autoform – a text processing routine.

RCA stated that the redesigned data management system enables faster file access through improved catalog management.

Also, it is said to provide improved channel utilization of random-access devices through sorting and queuing of off-line seek operations, and better application of track space through use of the same physical block size by all random-access devices. The data management system tests errors on a exception basis. The system also allows users to pass files from program to program for concurrent use.

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ACM May Aid Jailed Programmer

By Joseph Hanlon
CW Staff Writer

NEW YORK – The ACM may come to the aid of a black computer programmer who has been in jail awaiting trial for 17 months because he has been unable to raise $50,000 bail.

Clark Squire, 33, is one of 21 Black Panthers charged in an alleged bombing conspiracy. No bombings took place, however.

ACM members, individually, have already given money toward Squire's bail. A collection at ACM '70 netted $470, according to Edward Elkind, secretary of the Squire Committee.

The fact that the ACM (Association for Computing Machinery) allowed the Squire Committee to collect money during one of the "Town Hall" sessions at ACM '70, combined with its own consideration of the case, represents a sharp change in policy.

Previously the ACM had viewed itself as a purely educational organization. By its action, "the ACM came closer to public involvement than ever before," according to Dr. Herbert R.J. Grosch, an ACM Council member.

Immediate Study

At the ACM Council meeting Sept. 4, ACM President Walter Carlson agreed to an immediate study of the Squire case.

Grosch, who suggested the study, declared: "A white man with the same job and same charge would have been released on much lower bail." He asked the ACM to act, he said, because "we must consider the welfare of all members of our guild, without consideration of color and politics. The ACM should be devoted to more than just publishing algorithms."

Squire and the other Panthers were arrested April 2, 1969 and charged with conspiracy to kill policemen and to bomb department stores and the Bronx Botanical Gardens. No actual bombings took place, according to police, because the group was arrested before it could act.

Squire's bail was set at

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Introversion May Hurt Industry

'Lonely' Programmers Find Doors Closed

By Phyllis Huggins
CW West Coast Bureau

LOS ANGELES – The unemployed programmer is handicapped by the very qualities that made him a programmer originally. This same handicap has contributed to the high mortality rate of individual businesses in the industry, according to Dr. William Coleman, industrial psychologist with a long-time record of involvement in the computer industry.

Coleman, president of Coleman & Associates said: "We've had a problem in the industry for several years in that the people who go into programming tend to be introverts, content to sit alone and work out problems with little interaction with other people. This becomes an industry problem in that these very characteristics mitigate against their becoming managers.

"In addition, the very qualities that make a person become a programmer contribute to his difficulties in finding a job when faced with what is the first depression in the industry's history. The best way to get a job in today's market is call all your friends who know you and your work. But the solitary programmer may have few contacts that he can call."

No Agencies

Coleman does not advise the use of employment agencies now because personnel departments, due to the labor force cutbacks, do not have enough to do and are using their own resources rather than those of agencies.

This is another reason why personal contact is so important. As he put it, "We are in the stretchout phenomenon. When there is not enough to do people worry about it and stretchout the work they have. Personnel people, for example, are spending more time checking resumes and this sort of thing."

The management shortage in the industry is another matter. Coleman firmly believes that management people are born, not trained. He says management must be articulate, persuasive – management is always selling, to the people above and below, to customers, etc. They must also possess the ability to be sensitive to the needs of people and must be able to relate to them. Management must also have some human relations, skills; they need sufficient self confidence to make tough decisions and must be decisive, have perspective; be extremely energetic, highly motivated and results-oriented.

He added that management should know something about accounting and marketing which can be obtained in classes, but can't, in his opinion, get human relations skills from sensitivity classes or anything else.

He disagrees entirely with the premise that one can take raw material and develop management capability.

'Haves, Have-Nots'

"You've either got it or you haven't got it. A lot of companies don't know how to look within their own staffs and find managers," he said. "They think that if someone else is being paid $20,000 by another company he must be good so they hire him.

"This leads to the Peter Principle where everyone rises to the level of his incompetence. The big problem for an employee is getting the first management responsibility."

In Delaware It's a Case Of Just Too Much Too Soon

By a CW Staff Writer

DOVER, Del. – To hear local newspapers talk about it, "a faulty computer" held up 20,000 paychecks from state employees recently.

"Not so," said State Treasurer Daniel J. Ross, who agreed with part of an Associated Press story which attributed the problem to last-minute changes and inexperienced help, as well as the "faulty" computer.

Ross said that the checks were tardy, "not so much because of the computer, but because of errors in payroll registers."

There were about 80,000 changes to make in the 20,000 checks at the beginning of the fiscal year, and the State Highway Department's computer, an IBM 360/30, automatically rejected the incorrectly punched input cards.

Exact figures as to errors were unavailable, but all 20,000 employees received their checks late, from hours to three days, depending on their position in the alphabet or the complexity of the errors.

Besides undergoing fiscal year changes, including the elimination of the income tax surcharge, the Highway Department Data Center personnel had to cope with running a new program on a new system.

Apparently the combination of factors, with no trial runs, caused the collapse.

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Computer 'Rides' to Work With Chicago Commuters

CW Midwest Bureau

CHICAGO – With summer nearly over, the average Chicago commuter is looking forward to his morning and evening task of driving to work and then driving home afterwards with an understandable dread. Summer vacations took some of the cars off the expressways and September puts them back.

This September there may just be some relief for him, brought to him by a computer, some remote equipment, a local radio station's microphone, and an airplane.

Patterned somewhat on what her sister station, KNX in Los Angeles, is doing, WBBM, the CBS affiliate here, has turned to the computer for fast help in reporting the problems and the possible solutions to the commuter's traffic headaches.

Broadcasts

Called computerized traffic control by the station, the broadcasts began last week after 2,000 manhours of programming and three months of testing.

Using a Honeywell Time-Share 1648, Honeywell systems analysts and WBBM's Herb Howard fed input on traffic surveys, traffic flow patterns, and accident frequency into the system.

A density flow chart of traffic behavior was obtained by monitoring all radio frequencies available to WBBM and compiling the results of three months of testing using 14 two-way radio cars and the station's Cessna 150 plane.

A special studio, containing a Data Point 3300 CRT, a Vericom Compace 300 printer, 27 radio monitors of WBBM's 14 patrol cars as well as Chicago and Illinois State Police, was prepared for Howard, who is making the broadcasts.

By feeding accident, weather conditions, and other variables into the on-line system as soon as he receives the reports, Howard will be able to forecast the average speed of a driver on any given section of a Chicago expressway, driving times from on-ramps to off-ramps, locations of accidents, or other traffic jamming happenings, the amount of time a driver will be delayed, and the revised driving times for upcoming off-ramps.

Pick the Price

WEST MONROE, La. – What does it cost to make 6,000 custom-designed corrugated boxes to house three-bladed airplane propellers?

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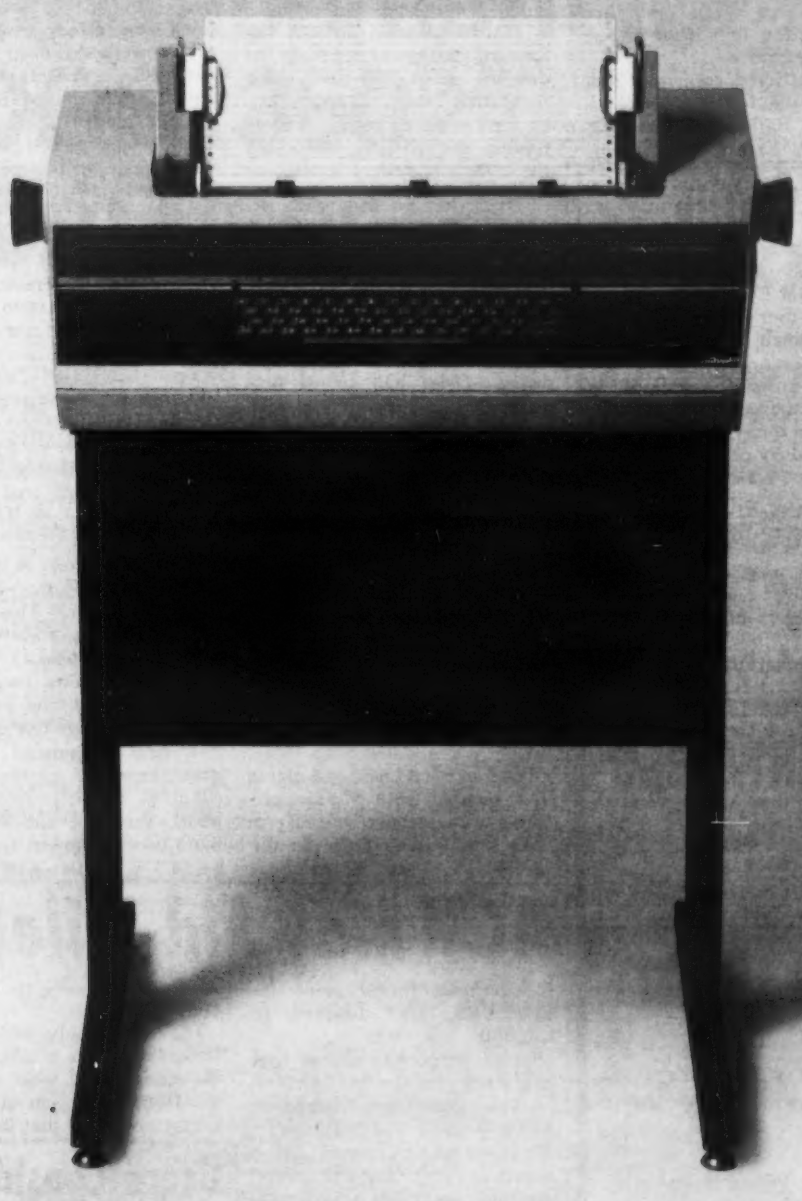
Representatives of the division's 10 manufacturing plants analyze the size, shape and strength requirements for containers to house these products. The information is fed into an IBM 360/30 here, via typewriter-like terminals at each plant.

Memorex breaks the speed limit with the 60 CPS Communication Terminal.



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MEMOREX

AF Viet Role Focuses on R&D, Practical Applications

(Continued from Page 1)

through channels to the Joint Chiefs of staff, known as Crest.

The equipment selected for handling all three segments represents quite an investment: two IBM 360/50s, Model I, 512K, each with a 2314 disk and the usual bells and whistles; and three IBM 1130s, 32K, with two 2310 disks and one 2250 CRT each. One of the 360 systems and all three 1130 systems are for Alms.

The remaining 360 system is intended to handle the other two segments of Seek Data II.

In May of 1968, CDC went to work without what it terms "the conceptual phase of systems design." As one CDC representative puts it, "We didn't have specs, just a gross set of operating requirements."

One hundred and ninety programmers and analysts were put on the task! They worked in Hawaii about a year and then came to Tan Son Nhut to test and implement.

CDC delivered segment Crest, in February 1970; segment II, Alms, in March 1970; and segment III, Frag Prep, in May, 1970.

Each segment has over 100,000 source statements, written largely in Cobol and BAL, with some Fortran. The software to operate the 1130s with the 2250s as I/O and to interface with the 360/50 is all original CDC work.

The work accomplished is spectacular, and the hardware certainly is extensive. The problem is that they seem to lack the forward motion to get from the delivery stage to the implementation stage (implementation meaning, of course, discontinuing the parallel operations the computer system is designed to replace).

There are many reasons for this. Not the least is that the system programmed was frozen well over a year ago to get on with the huge programming task.

During that time, new requirements materialized and were collected. These had to be programmed and integrated into the segments already programmed. Secondly, the test data admittedly was different in Hawaii than the data to be found in Vietnam under real combat conditions.

So live testing must be accomplished. But, to be valid, the new requirements must be incorporated first. Thirdly, Crest has been discarded; no one seems to be willing to say why. Fourth, no one appears anxious to discontinue manual "fragging" of aircraft, and who can blame them?

You can't send men and planes into combat with a plan prepared by a partially tested program that doesn't quite do the whole job. This is why Seek Data II might be interesting as an R&D project but is hardly impressive as an on-going system.

There are even a couple of problems with the system as an R&D project. First, there are no Air Force personnel sufficiently conversant in the technical work to take it over and implement it, even though they are phasing down the contract personnel.

They were down to 47 CDC people on Seek Data II in Vietnam as of the end of fiscal 1970 and will reduce to 31 for fiscal '71. A project as complex as this will take a well-trained and a good-sized staff to maintain and keep current.

It is obviously desirable to do so with Air Force rather than with contract personnel, but who is going to train the Air Force personnel if the contract people leave? You don't pick up responsibility for three 100,000-source-statement applications overnight.

Secondly, 200 man-years of well-paid personnel plus six expensive computers cost a lot of money, even for an R&D project.

The situation is different for other Air Force computer applications here. There are 11 Air Force bases in Vietnam. The support functions at eight of them have been mechanized. They all use the same equipment and the same standard programs. For base operations (aircraft maintenance, personnel, accounting, traffic control, motor pool), they use the Burroughs B263 card computer, augmented by IBM 870s distributed throughout base activities for punching inputs.

Air Force base supply runs on Univac 1050s, each with 128K characters of core storage and 66K characters per drum of drum storage, two drums per 1050. The 1050 at Ton Son Nhut also has a remote hookup with Binh Thuy Air Base (recently taken over by the Vietnam Air Force), 100 miles from Saigon.

The Air Force also has a 360/40 at Tan Son Nhut for its intelligence data handling system. This is a 128K computer running under DOS, with six tapes and a 2314 disk.

Six IBM programmers and two Air Force programmers write Cobol programs and maintain 1410 programs under emulation for the 7th Air Force Directorate of Intelligence. They do bomb damage assessment, manager reconnaissance, and maintain 21 formatted files in an intelligence data bank..

Altogether, the Air Force in Vietnam has three 360s, three 1130s, eight B263s, and eight 1050s. The Air Force uses packaged programs (for base support), or writes its own with vendor assistance (for intelligence), or contracts for software (Seek Data II).

Its use of computers is actually growing, although Vietnamization is proceeding on or ahead of schedule. Thus, the Air Force role is more signficant as U.S. troops are withdrawn, and will be until the Vietnamese Air Force is equipped to assume the air mission itself.

Common Meets in Seattle

By Robert L. Glass
Special to Computerworld

SEATTLE – The voice of the small IBM computer user was heard in Seattle last week as Common, a user's organization for IBM 1130, 1800, System 3, 1620, and small 360 installations, held one of its three annual meetings here.

Chief lures to participants were the "soundoff" sessions, in which users and IBM representatives discussed problems and solutions in the use of their equipment.

Opening session speakers were Larry Mahoney of R.W. Beck and Associates, Seattle, and James Kelley of the University of Washington oceanography department.

Common is the outgrowth of an IBM 1620 user's group, and was formed in 1960. As illustrated by a show of hands at the opening session Wednesday, a majority of its participants are now IBM 1130 users. Over 50% of the attendees represented 1130 installations; nearly 25% were small 360 users and another 20% had 1800s.

Of the remaining 5%, most were 1620 installations.

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ACM May Aid Jailed Programmer

(Continued from Page 1)

$100,000, later lowered to $50,000.

Squire supporters charge that convicted murderers in New York are sometimes released on $25,000 bail, and that white Weathermen arrested on a bombing conspiracy charge were released on $2,000 bail. The high bail for the Panthers, they claim is part of a nationwide attempt to suppress the group.

Squire has been a programmer since 1957, when he graduated from college at age 19. He spent seven years with aerospace and defense companies, and at the time of his arrest was working for Computer Decisions, Inc.

Squire's April 1969 arrest was not his first contact with police. He was arrested Jan. 17, 1969 because a car, rented for him by his employer, was allegedly used in a "shoot-out." After two weeks in jail, "I was brought to court and the charges dismissed, then rearrested on the spot in court on a two-month-old unsolved armed robbery of a subway change booth. At that time my annual salary exceeded $17,000," Squire said.

The subway charge was dropped several days later, and Squire returned to work until he was arrested April 2, 1969 on the conspiracy charge. According to Squire's attorney, the only basis for the conspiracy charge against Squire was the alleged use of the rented car in the shoot-out. Squire is charged with no other acts, the attorney said.

The ACM study will consider both the merits of the case and the question of what ACM can do. Donn Parker, an ACM Council member, said that the council felt "a sense of urgency" about the case. If the investigation reveals an injustice, he continued, ACM headquarters will take prompt action without further initiative from the ACM Council.

Users Consider Debugging Charge

(Continued from Page 1)

hope that this will be worked out soon, but he does intend to apply as much pressure as possible on his manufacturer. His installation is one of the largest in the U.S., and he might have some luck.

The basic principle is very simple – if the user has to pay for a particular service, why should the manufacturer be exempt from the same type of payments? The Federal Government charges its expenses on debugging aircraft back to the aircraft manufacturers. Large companies often charge their suppliers the cost of equipment shakedown and testing. It seems reasonable that the large data processing user should charge back similar time and manpower expenses to his supplier.

From the reactions of the large sites interviewed, it appears that debugging charges to the unbundled manufacturers may become an open, hard-fought issue.

RCA Software Called More Efficient

(Continued from Page 1)

Version III Fortran and Cobol compilers and the TSOS Assembler, the company said, operate using disk work areas and are themselves pageable and produce pageable programs.

Some of the additional utility routines mentioned by RCA include message processing, interpretive scanner and processor, tape operating system (TOS) load module transcriber, and an input-output tally routine.

Other features incorporated in the new TSOS include Fortran and Assembler symbolics as additions to the Interactive Debugging Aid (IDA) and Assembler Diagnostics. With symbolic labels available under IDA, RCA noted, the programmer can refer to parts of the program by name, rather than by actual location, during debugging.

As with all RCA operating system, TSOS-Version 6 is being distributed without cost to the users.

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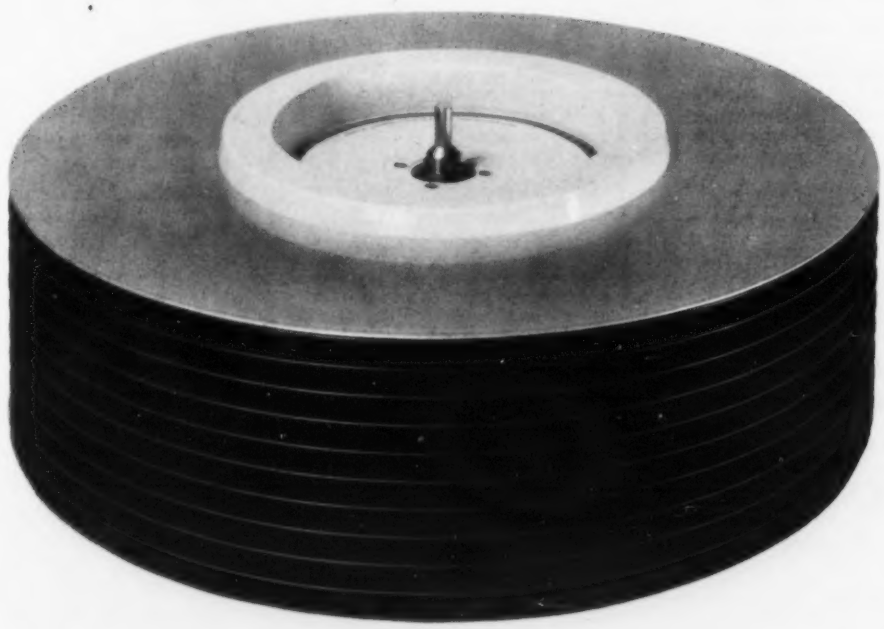

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Forecasting Tool

Swift Plans Computer Model of Business

CHICAGO – Swift & Co. plans to build a computer model of its $2 billion-a-year fresh meats business.

When completed, sometime in mid-1971, the electronic recreation of the world's largest meat-packing operation will provide corporate management with a forecasting and planning tool capable of testing innovations, and calculating the financial and operating results of such actions.

"We will be able to ask 'What will happen if?' type questions," said Donald P. Kelly, vice president, finance.

Kelly said there has been rapid advancement in the last few years in design and programming of large computer simulation models, and that they are now being used in not only the military, but in industrial applications.

He said the Swift model will be one of the most advanced and complete corporate planning tools yet developed by an industrial firm.

Swift's meat-packing operations, conducted by its Swift Fresh Meats Co., includes a network of 25 plants and more than 130 sales and distribution units.

Planning for the model development has been in progress since early 1969, when a preliminary feasibility study was completed for Swift by the Advanced Systems Development Division of IBM.

"Computer models of this sophistication go far toward capturing the authentic complexities of a real enterprise. They are powerful analytical tools," Kelly said.

One Hole Too Many for the Voters

DETROIT – A computer error . . . well, a card reproducing machine's error . . . that is, something described as "about as common as a Xerox machine making a spelling error" has been blamed for this city's current computerized vote crisis.

Latest word has it that the city will retain the computerized punch-card voting system for the Nov. 3 election.

However, the city will also extend its option to buy back its 3,300 lever-type Automatic Voting Machines which were sold to the company holding the computer-voting contract.

Meanwhile, the state legislature has ordered a full-scale investigation into causes of the vote flap. There were reports of missing precinct vote tallies, and of deliveries of the punch cards to the wrong centers.

City Clerk George Edwards has been reported meeting almost daily with various interested groups, and has been unavailable for comment. He has been quoted as favoring the computer-vote system, but only after voters' shaken confidence has been restored.

Cause of a two-day delay in final results has been laid to a card reproducers making an extra hole in one in a test deck, an official in the city's Corporation Council's office said. The reproduced test deck was then used to duplicate the deck four more times, so that five of the six test decks were erroneous.

The official stated that a verifier did not detect the extra hole in the test card.

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Detailed bid specifications may be obtained from the office of the State Central Data Processing Authority.

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STATE CENTRAL DATA PROCESSING AUTHORITY
Charles L. Guest
Executive Director

(September 16, 1970)

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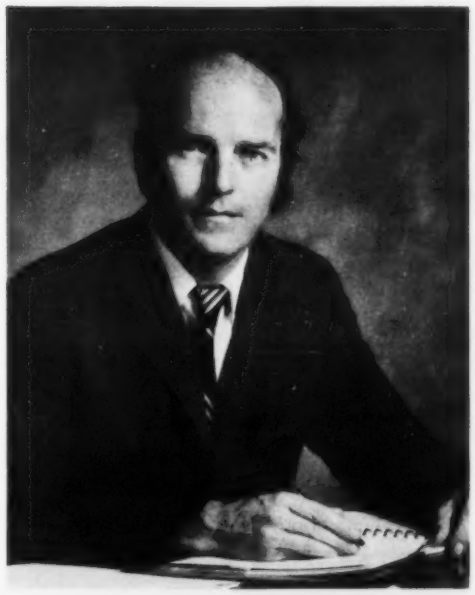

over 3,000 statements and some 7 to 8 weeks. We now use WORK TEN for 100% of our COBOL projects.

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Editorials

Potential for Evil

Every so often some new computer application is announced which vividly reminds us that 1984 is only 14 years away.

The latest in this category is an edit program that reads name and address lists and selects names based on ethnic parameters.

At the very least, such edited lists are likely to be used in ways which will tend to reinforce stereotypes and to divide further the population. At the worst, such edited lists conjure up Hitlerian nightmares.

Since computers have no ethics, responsibility for the proper use of them falls entirely on the people who manage, program, and operate them.

That's a lot of responsibility for a person who probably thinks of himself as an average citizen with a very small voice.

'Well, That's Three Down, Only Two to Go.'

Letters to the Editor

Data Processors At War: Well Done

The article in the June 10 issue of CW, entitled "Computers at War: army DP Vital to Viet Effort," has been read with great interest in Vietnam. The author, Mrs. Bernice Pantell, has done a creditable job of portraying the ADP situation. However, certain aspects of the article call for clarification.

ADP-wise, the supply system for other than aviation and medical supplies in Vietnam comprises three levels of effort. The base is the NCR 500 system of the direct and general support units which operate standard ADP programs written and maintained at Fort Lee, Va.

The middle level is the 3SVN depot ADP system which supports depot stock control, storage and transportation operations.

At the apex or top level is the ADP system of the Usarv Logistics Data Service Center (LDSC) which supports supply management operations of the USAICCV.

The 3SVN depot system is, and has been since October 1969, a standard ADP system. The programs are operated on a standard IBM 7010/1460 configuration at three sites.

Each depot has proponency for maintaining one-third of the programs under the supervision of two people at LDSC, and unilateral changes to the programs are not authorized.

ADP programs of LDSC are unique in that there is only one USAICCV. However, these programs are basically 3S programs modified to fit special circumstances in Vietnam.

To the extent possible, data is exchanged between LDSC and the depots by magnetic tape. Each morning an LDSC courier travels to Cam Ranh Bay and Qui Nhon for this purpose, returning that afternoon. Of note, the transceiver system is a common-user system and is relied upon for high priority and special transactions.

As for the transaction volume, the total for both depot and LDSC processing was 4 million transactions monthly at the time of Mrs. Pantell's visit.

Since then approximately 50% of the duplicate processing has been eliminated, and for the system as an entity, monthly volume is now under 3.5 million transactions.

Moreover, what duplicate processing remains is essential if visibility of depot asset balances is to be maintained at the LDSC.

Significant improvements made in 3SVN ADP operations during the past year also should not be overlooked. First and foremost, the ADP system has been standardized and disciplined.

Second, supply cycles are now processed daily at each depot. Third, the Usarv Logistics Data Service Center was established and has taken over the ADP operations of the USAICCV.

Fourth, the 77-hour supply cycle at LDSC is a thing of the past. Six supply cycles with an average run time of 24 to 30 hours are now processed weekly at LDSC in addition to a special Redball cycle daily. Finally, the supply cycles of LDSC have been synchronized with those of the depots.

Transaction output tapes from depot cycles are now introduced into a cycle at LDSC within 12 hours after completion of the former. In short, ADP system throughput time for a requisition is now 4 to 5 days as opposed to 28 to 30 days it took in September 1969.

The above are noteworthy accomplishments. They have been achieved through the efforts of the finest group of data processors – military, DA civilians, Vietnamese, and Computer Sciences Corp. contract personnel – ever assembled in a combat theater of operations.

And needless to say, these accomplishments would not have been possible but for the fine work done by those who served here in 1968 and 1969.

James S. Welch
Colonel, QMC

Commanding Officer
Usarv Logistics Data Service Center
Long Binh, Vietnam
APO SF 96384

Computerworld welcomes comments from its readers. Preference will be given to letters of 250 words or less. *Computerworld* reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

D.C. Data-Line

Communicating With the Public

By Alan Drattell
CW Washington Bureau

NEW YORK – Mrs. Lucille Friedman teaches business subjects at Francis Lewis High School in Flushing. She said her students have asked her about private EDP schools. Because she did not know where to get information about these schools, she decided on her own to visit some of them.

"I sat in on classes," she said. "I was impressed with some of the schools, and I was mortified with others."

Mrs. Friedman related her dilemma during a special panel meeting on "Careers in Data Processing" presented here during the recent Association for Computing Machinery's 25th annual meeting.

The meeting, to which the genral public was invited, was cosponsored by the New York City chapter of the ACM and the ACM Accreditation Committee, chaired by Dr. Carl Hammer of Univac's Washington, D.C. office.

Dr. Hammer, who sat on the panel, offered Mrs. Friedman a solution to her problem. He suggested she write to him for copies of ACM's guidelines on private EDP schools.

Mrs. Friedman then asked how school teachers and students could determine from the guidelines which private schools are good. The answer is they really cannot.

Mrs. Friedman's repartee with the special panel points out quite clearly the chasm that exists between the non-computer public and the EDP community: when we in the industry speak we unfortunately often converse with ourselves.

The ACM's convention was a bold attempt to bridge that

Alan Drattell

chasm, and the special meeting on careers in data processing was attended by about 300 society members, school entrepreneurs, EDP school graduates, and others interested in private schools.

The panel was not supposed to solve any problems; it was only to air them through a dialog with the public. And, thanks to Mrs. Friedman, it also provided a cue for the industry of what needs to be done.

Role of Societies

If professional societies have any real validity and if they are more than just a common meeting ground for industry people, they must provide the vehicle for crossing the bridge that separates the computer community from the general public.

Mrs. Friedman and thousands of other concerned teachers across the country do not know that if they write to Dr. Hammer or any one else at ACM they will be able to get copies of the guidelines. In fact, these people have probably never heard of Dr. Hammer or ACM.

It is the job of ACM and the Data Processing Management Association, which has also published school guidelines, to make their efforts known to the Mrs. Friedmans in our public school system.

These associations should be the interface between the industry and the public, providing guidance.

Accrediting Agencies

Most importantly, the public should be able to look to these two organizations to offer policing of the private EDP school sector so that the Mrs. Friedmans can get a clear answer to the question: "How do we know which ones are good ones?"

The recognized accrediting agencies currently do not recheck the schools they have endorsed for a period of five years. That is too long a time.

Also, these accrediting agencies do not deal only with private EDP schools. Today they may okay one that specializes in turning out sheet metal operators, tomorrow one for secretaries and next week an EDP school.

But who knows better than individuals who are members of professional societies which private EDP schools offer meaningful curricula and which do not?

As Ronald S. Pugsley, chief of the accreditation policy unit of the U.S. Office of Education, said as panel moderator: "No longer can the computer industry abdicate its responsibility. The 1970s should be the age of accountability in computer education."

And to this we add: The 1970s should also be the age in which the professional computer groups go beyond the initial steps they took at ACM '70 to communicate with the people outside the walled-in computer room.

Different Forms of Attack

Where Can You Control Your Cobol Overhead?

Writing a Cobol program appears to be a simple operation. You simply describe the data, write out the procedures, and run a compilation. You don't need to do anything else – for instance, understand the hardware on which the system is going to run; or the operating system the object program will use. These can be left to the experts.

All of which is perfectly true. However, having a Cobol program written so that it runs efficiently on your particular hardware is not so simple. It may mean that you will have to think about a number of factors, and not just about the question of getting a program that runs.

The Taylor Report

By Alan Taylor

This is because a decision about any particular point – whether or not that decision is made by your Cobol programmer – may be costing some machine time wastage. Which means dollars. Your dollars.

Recent developments have brought out that Cobol overhead not only is high – but also that it can be attacked from many different standpoints. In general, each different form of attack indicates different potential weaknesses; although in some cases – such as wastage caused by excessive use of the perform verb, for instance – more than one attack can be used.

These developments include the provision of compilers which can replace those provided by IBM, an optimizer which can improve the output of an IBM Cobol compiler, and the provision of courses dealing with how to write efficient code.

To see the relationship between the various systems, consider the actual workings that lead up to the running of a Cobol program (Figure 1). To start with there is the selection and installation of the hardware itself.

Different types of hardware have different characteristics – and can be connected together in different ways. A set of statements that can be executed in one hour on one system may well take two hours to run on another system which outwardly has the same power.

After the system has been installed, the operating system is selected, and *Tuned*. Here lies the catch. Operating systems differ as much from each other as hardware installations. How a set of tapes is wired to a particular controller, or to a particular channel at installation time can limit the way that a Cobol programmer can set up his program. Equally, operating systems are set up to meet what is believed to be the needs of the particular installation and result in equally stringent limitations which the Cobol programmer can do nothing about – and which he rarely realizes are in existence.

This process is normally called "system generation" and can affect efficiency in a number of different ways – particularly regarding input-output operations.

Then comes the compiler. It has certain obvious areas where it can affect efficiency, and is one of the major visible elements. It is used, naturally, to compile the programmer's program.

Alan Taylor, consultant, writer, and former editor of *Computerworld*, is president of Computer Management Aids Corp. of Framingham, Mass.

Apparently it only appears on the progress of getting a program into operation once – but actually it is also used to help debug the program that the programmer is writing, and so a loop in the process occurs here.

Then comes the data itself – the items that are to be processed. They have to be accepted and processed, naturally – but there is always a chance that some optimization can take place using their characteristics, or alternatively changing them in some way so that they do have usable characteristics.

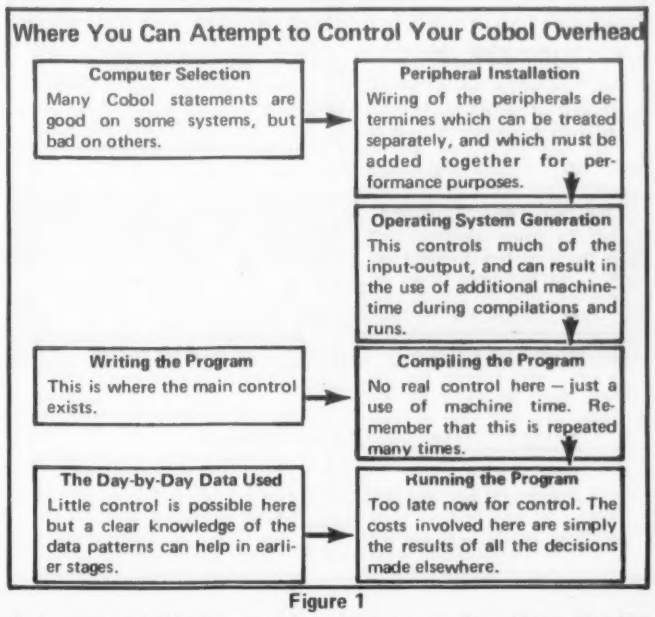
Where You Can Attempt to Control Your Cobol Overhead
Computer Selection
Many Cobol statements are good on some systems, but bad on others.
Peripheral Installation
Wiring of the peripherals determines which can be treated separately, and which must be added together for performance purposes.
Operating System Generation
This controls much of the input-output, and can result in the use of additional machine-time during compilations and runs.
Writing the Program
This is where the main control exists.
Compiling the Program
No real control here – just a use of machine time. Remember that this is repeated many times.
The Day-by-Day Data Used
Little control is possible here but a clear knowledge of the data patterns can help in earlier stages.
Running the Program
Too late now for control. The costs involved here are simply the results of all the decisions made elsewhere.

Figure 1

Looped Operation

And finally comes the actual object program run itself. Like the compilation, it is not normally a one-time affair. Instead it is a looped operation, which is repeated time after time. Because of this, it is normally the most important area of consideration – by far. But it rarely gets its proper share of the attention.

However, that is not what we are currently concerned with directly. All we want at the moment to see is just from where Cobol overhead can be controlled – and to do this we have to see the process of using Cobol in relationship with the full process of writing Cobol programs.

This we now have – and next week we can start checking at each stage to see whether or not controls currently exist which can affect the cost of the Cobol operation. Then we will be able to examine the possible remedies.

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Firm Stays Together

Alumni Group Bridges 'Friendship Gap'

Employment peaks and troughs are the fortunes of war to aerospace companies. Many EDP employees find themselves part of a strangely itinerant society, moving from job to job in a cycle based not on the seasons but on the whims of war and governments.

In the process of these changes of personnel, many friendships are made, then broken. Back in 1965, when the Aerojet-General Corp., a missile and space propulsion company, began an employment decline, several Aerojet employees concluded that there must be a better way. The Aerojet-Sacramento computing organization had been an especially closeknit clan, staying together with minimal team turnover for eight years or more.

'Friendship Gap'

As the team gradually broke up to seek greener pastures, it decided to do something about the burgeoning "friendship gap." The Aerojet Alumni Association was formed. Eligibility for membership consisted of having left the Aerojet employ. Chief function of the association was to maintain a membership roster.

The association thrives today. The roster, now with close to 100 names, has grown from containing simply names, addresses and company affiliations, to include the latest achievement or (publishable) personal note about each member.

Members of the association have scattered with the fortur.es of computing and aerospace, all across the country and as far as Belgium, Denmark and Vietnam. The roster has been especially valuable in mutual recruitment programs. Although members joke that each should send an offer of employment to another

Viewpoint

once a year to boost group morale, many alumni have actually either gotten employment or sought employees through the roster and the group.

The mainstream of the association is now in Los Angles, scattered among the aerospace and software companies there. Los Angeles members get together frequently for group lunches. Fred Newman, an employee of Code, Inc., is the social ramrod of the group there. Bob Glass, out of the organizational mainstream at the University of Washington in Seattle, maintains and distributes the roster.

The association, now in its fifth year, has been an interesting and successful experiment in overcoming a social phenomenon of our time. The friendship gap is still there, but the ties of the Aerojet Alumni Association keep it from widening to a chasm.

Computer-Controlled Rapid Transit System May Save L.A. Commuter

EL SEGUNDO, Calif. – Los Angeles, the most automobile-plagued area in the country – it is estimated that one-third of the downtown area is given up to streets, freeways and parking lots – has heard a proposal from a "think tank" to relieve what is rapidly acknowledged as an "unsolvable" problem.

Aerospace Corp., an Air Force-supported "think tank" whose board of directors in the last few years has allocated increasing amounts of funds for society-related problems, has presented a potential solution in a computer-controlled rapid transit system.

The computer-guided monorail system would not be a rigid large car system but would be a flexible one composed of individualized units that would whisk the commuter at 60 mph to his destination.

As light cars rather than heavy trains are involved, the supporting structure would cost less than other proposed systems. Estimated costs are about one-third of more traditional monorail concepts. Computers would be required to determine optimum routing, traffic congestion handling and intersection manipulation. Computers would also continually sample the input streams created by traffic demands.

A word of advice to anyone concerned
with developing an inexpensive, ultra-dependable 300 (or 600) card-per-minute reader that comes in rack-mount or table-top models, can be maintained by almost anybody, and has interfacing that makes it plug-compatible with just about every system on the market . . .

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and could put the whole 75,000-component CPU on one card, then give it the first *all*-semiconductor main-frame memory,

3

and be able to talk to it on up to 32 keyboards at the same time,

4

and have it talk right back on up to 32 video displays at one time,

5

and give it foreground terminal software in addition to disc and IBM-compatible communications packages,

then:

You'd have System IV/70—the data-base access system of the 70's □ System IV/70 solves the data flow problem between the user and the computer. By integrating a computer with a cluster of video terminals, System IV/70 provides a more effective man/machine interface. □ Up to 32 System IV/70 video terminals are controlled by the IV/70 local computer which guides the user through the data entry steps, pre-processes and formats the data, stores it on disc for local use and/or transmits it directly to the central data base.

This cluster concept means:

- □ Increased output with fewer data-entry personnel.
- □ A reduction in the number of human errors which occur during normal multiple-step entry.
- □ Reduced connect and processing time at the central computer site.
- □ More efficient data transmission.
- □ Local format storage.

The result is cost reduction. The purchase price per System IV/70 terminal is $980! **Our phone number is (408) 255-0900.**

specs.

System Description

System IV/70 is a display processing system designed for *data entry and retrieval* to and from data bases and computer systems. A maximum of 32 video displays may be connected to, and controlled by, a System IV/70 computer which, in turn, communicates with the central computer facility. System IV/70 interfaces with IBM 360/370 systems locally or remotely – and with unmodified IBM software through a System IV/70 foreground communications package. A subset of this package completely simulates an IBM 2848/2260 data station complex.

During normal System IV/70 operation, display and communication operating overhead is only 10 to 20%, leaving 80 to 90% of the System IV/70's time available for user background programs such as data validation, error checking, formatting and local processing and storage before transmission to the main computer.

Video Terminal (Standard Features)

Characters per screen: 1152.

Screen Format:	40, 48, 80 or 81 characters per line; 6, 12 or 24 lines per screen.
Edit Capability:	Character insert and delete, line insert and delete, roll up/down, tab, erase, and 10 cursor control functions.
Format Capability:	Split screen and protected display areas for "fill in the blanks" data entry, and selected transmission.
Suppressed Display:	1 to 15 character suppression for entry of confidential information or restricted access.

System IV/70 Computer

Memory:	1.9 μs cycle-time, semiconductor mainframe memory expandable to 96K bytes.
Speed:	Character move, 2.5 μs/byte Character compare, 3.8 μs/byte Decimal Add/Subtract, 5.1 μs/byte Binary Add/Subtract, 15.2 μs/24 bits
Instruction Set:	120 major instructions including variable length byte instructions, binary fixed and floating point arithmetic, translate/test, push/pull stacks, register to register, and list processing instructions.
Input/Output:	8 I/O channels; 64 devices/channel; 8 levels of nested hardware priority interrupt (standard); single firmware I/O interrupt instruction; maximum I/O rate 265,000 bytes/second.

Peripherals

Fixed and moving-head disc drives, asynchronous and synchronous communications interfaces, IBM compatible magnetic tape drives, high speed printers, card readers and paper tape reader and punch.

Software

Foreground video-display control packages including a 2848/2260 simulator package, terminal communications software compatible with IBM OS/DOS (BTAM and QTAM), disc operating system with sort routines, and basic operational software.

General

The System IV/70 may be configured for a variety of applications. A combination of sixteen $980 terminals and a 6K CPU results in an average per-terminal purchase price of $1450. A complete 32-terminal system with 24K CPU, disc drive, communications interface and printer would cost $1950 per terminal.

FOUR-PHASE SYSTEMS, INC., 10420 North Tantau Avenue, Cupertino, California 95014

ADR's MetaCobol Macros Ease Source Coding Chores

By Don Leavitt
CW Staff Writer

PRINCETON, N.J. – Cobol programming becomes more flexible and less clumsy for 360 users with the MetaCobol macroprocessor, available for $6,000 from Applied Data Research (ADR).

The precompiler allows the programmer to define new verbs for use in his programs, to create and use macroinstructions, or to use ADR-supplied macros, and at the same time, to use shorthand notation for many of the Cobol-required words or phrases.

Accepting standard Cobol and user-defined MetaCobol statements, the processor transforms them into acceptable source language for the IBM Cobol compilers, Level-E, -F, or ANS.

Other options available with the MetaCobol package provide for test data generation and runtime analysis, to speed the debugging process, ADR said.

OS or DOS

The current MetaCobol takes 80K bytes of storage, but ADR said that a new version, expected to be available within a month, will allow the processor to run on a 65K 360/30, or larger model, under either OS or DOS.

ADR describes the macro facility available through MetaCobol as comparable to that of Basic Assembler Language. With it, the programmer or software writer can create functions not available in Cobol, or access series of programming steps that are used repeatedly.

While ADR encourages the development and use of custom-tailored macros to perform functions unique to an installation or industry, the company provides the macros for common functions, such as clearing group items to either spaces or zeros, printing lines, recognizing control breaks and printing totals, and handling the end of reports.

The verb translation/conversion capability could be useful, the company noted, in adapting a source program to an otherwise incompatible Cobol compiler.

More dramatically, it could enable a programmer unfamiliar with English to code in his own language, which could then be converted into English prior to compilation.

The abbreviations available to the programmer under MetaCobol range all the way from "ID=program-id BY author," which generates the PROGRAM-ID and AUTHOR statements in the Identification Division to "FP=picture," which produces "FILLER PICTURE IS picture," in the Data Division. Other examples include "-RMF" for "RECORDING MODE F" and "DR=names" for "DATA RECORDS ARE names," in the file section.

A prefix capacity allows the programmer to identify uniquely corresponding data names in abbreviated forms, which are expanded into conventional qualifiers in the MetaCobol output.

The Test Data Generator, an optional facility, permits the programmer to generate test files from existing Environment and Data Division entries. ADR said that the user may indicate any desired file sequence, and any valid Cobol file organization can be generated.

The Test Data Generator can be used to generate deliberately faulty records, ADR said, so that the programmer can test for abnormal data conditions.

The Run Time Analyzer options allow the printout of selected data in source language form during execution. The company said that data names and any associated data will be edited so that it can be easily read.

The basic MetaCobol processor costs $6,000. The Test Data Generator and the Run Time Analyzer options are priced at $1,500 each.

Applied Data Research is at the Route 206 Center.

GT&E Package Transfers Files Between Central, Remote CPUs

FORT WAYNE, Ind. – High-speed transmission of data files or problem programs between a central and one or more remotely located computers is possible with a software package from GT&E Data Services Corp.

The Bisynchronous Oriented Communications System (Bocs) is designed for computer-to-computer transmission of sequential data files over leased telephone lines. GT&E said that Bocs will support leased lines with transmission speeds of 1.2K to 240K/sec.

25 And Up

The system is compatible with multiprogramming environments. It is written for 360/25 or larger and occupies one partition under DOS, one partition under OS/MFT-II or one region under OS/MVT.

Data is transmitted to and from either magnetic disk or tape files. In addition to controlling multiple circuits, Bocs can support several remote locations on the same circuits. GT&E explained that by installing bypass switches in the remote locations, any center can be either linked to the master station or skipped over to allow use of the circuit by another center.

Bocs has error recovery routines to insure maximum accuracy and minimum downtime, such as the capability for retransmission of a single or selected volumes of a multivolume file. In addition, transmission on a circuit can be stopped and then restarted at a later time without retransmitting any data, according to GT&E.

Statistical logging of error data and other information, such as transmission time and circuit efficiency, is also provided by the system, GT&E said.

The company said that Bocs can be used to centralize the user's programming and systems personnel, and simplify the maintenance of master files. Alternately, it can be used to distribute the work load among several large computer facilities if centralized data processing is not desirable.

Within the master processor, Bocs takes 15K bytes of storage for the program itself, and additional core to set up four buffers for each circuit being supported. Buffer size can be specified by the user, GT&E said, or a default option will provide 2K byte buffers. The program in the remote processor requires 10K bytes, and the same buffer requirements as in the master unit.

The buffers are required, the company explained, because Bocs uses IBM's Queued Sequential Access Method (QSAM) for the file-core transfer of the data. The package also uses IBM's Basic Telecommunications Access Method (BTAM), and the 2701, -02 or -03 Data Adapters, for the communications processing.

Bocs is available for a one-time lease charge of $9,650, which includes installation and training at the master station and one remote location. There would be an additional charge of $5,000 for a second remote location, and $2,000 beyond that, for a third.

The Bocs package is also available on "no installation" and/or monthly rental plans, a spokesman added.

GT&E said that it will provide systems support throughout the life of the package.

Bocs is being handled by the GT&E regional office at 6430 Oak Brook Parkway.

IBM to Reclassify DOS RPG Compiler, Cobol DASD Macros and Fortran D

WHITE PLAINS, N.Y. – IBM has told DOS/360 users that the RPG compiler will be changed to programming service classification "C" as of next February. Other program products similarly reclassified include the DOS Cobol DASD Macros and the Fortran D processor, and the Demand Deposit Accounting application package for banks. The products being reclassified in IBM's current notice are being changed from "B" to "C."

The IBM computer-generated notice, dated Aug. 10, was addressed to individual users with the following text:

IT IS IBM'S PRACTICE TO PROVIDE SIX MONTH'S ADVANCE NOTICE OF ALL PROGRAMMING SERVICE CLASSIFICATION CHANGES TO USERS OF RECORD. ACCORDINGLY, THIS IS TO NOTIFY YOU THAT THE FOLLOWING PROGRAM(S) IS CHANGED TO PROGRAMMING SERVICE CLASSIFICATION 'C' EFFECTIVE FEBRRUARY 15, 1971.
360AFB15X DEMAND DEPOSIT ACCOUNTING
360NCB468 DOS/360 COBOL DASD MACROS
360NFO-451 DOS/360 FORTRAN D
360NRG460 DOS/360 RPG

The notice was issued by the Program Information Department of IBM and included the individual user's customer number together with a notation that a copy had been sent to the local branch office.

Although notice to users gave no explanation of what was meant in terms of programming support, letters explaining the range of classifications, "A," "B" and "C" were sent to all users of record shortly after unbundling last year.

At that time, users were told that products in the 'A' classification would be provided free central programming service and free field engineering programming aid to solve immediate problems traceable to the IBM packages.

Free Service

The "B" classification also provides free central programming service, but includes field engineering support on a billable basis.

In the "C" classification, the products do not have central programming service but can get the field engineering, again on a billable basis.

IBM explained that the central program service meant that problems reported by users or staff would be checked out and, if necessary, corrections to the programs would be included in the next release of the product.

Although the "C" classification does not provide that level of support, IBM told CW that any problems reported prior to the effective date of the reclassification, would be handled as usual. IBM also told CW that as a general policy, reclassification to the "C" level takes place when a product reaches a "minimum defect level" and the central programming service is no longer required.

In the case of the Cobol DASD Macros, the company noted that the Cobol compiler itself now includes support for the Direct Access Storage Device. Therefore the macros, set up as an interim product to fill the gap when the compiler did not support DASD directly, were no longer needed. Fortran D has been supplanted by various later versions.

The RPG compiler has been out since 1966 and, although one user told CW of "bugs" he had found in what he called "an excellent product" most users are apparently satisfied with it in its current condition.

In the event they need the field engineering support, users can get it for $30/hr, IBM said.

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Mr. Albert Goldstein or Mr. Dwight Hilleman

IBM Adds to PL/1 Support with Checkout Compiler

WHITE PLAINS, N.Y. – Installations with massive core available under OS/360 can use a new compiler from IBM to speed the writing, compilation and testing of PL/1 programs.

The OS PL/1 checkout compiler couples test-run with compilation capabilities, but requires 100K bytes of storage (total for compiler and user program) and a related subroutine library, the OS PL/1 transient library, to function.

The checkout compiler can be used in time-sharing as well as batch-processing environments. It will run under OS on either the 360 or the 370, IBM said.

Used by itself, the compiler provides all the features previously available in terms of high speed translation and diagnostics during the conversion from source to object code. In addition, it provides 'load-and-go' capability for the compiled program, if desired.

The checkout compiler also provides diagnostic information during test runs, IBM said, to cut down the number of runs required before a program is ready for productive use.

Test-run features include:

- Diagnostics that pinpoint errors by statement number, and print messages in full or short form, at the user's option.
- A continuous record of program branches and statements, that allow tracing that can be turned on or off as desired during program execution.

Used with IBM's Time-Sharing Option (TSO) Program [CW, Dec. 17, 1969] the checkout compiler allows the monitoring of PL/1 programs from remote terminals during development. Programmers at terminals can make corrections as problems occur during execution.

TSO runs on the 360/50 through 195 under OS/MVT and allows a mix of batch and time-sharing jobs. It requires a 384K system for dedicated use, or a 512K system for use in a concurrent batch environment, according to IBM.

Used with IBM's OS PL/1 optimizing compiler [CW, July 8], the checkout compiler enables programmers to execute debugged segments as they test run other parts of the program. The optimizing compiler is said to provide significant improvements in execution speed. The optimizer and the checkout compiler both include what IBM calls major improvements to the PL/1 F-level language and interlanguage communication with Fortran and Cobol modules.

The checkout compiler is scheduled to be available in the fourth quarter of 1971, at $340/mo under a license agreement.

The PL/1 transient library will be available under a license agreement for $25/mo. And the optimizing compiler, as previously announced, is expected in the third quarter of 1971, at $250/mo under license.

'Sarg' Takes Charge of Reports

RIVERSIDE, Calif. – A report generator capable of handling equations including five factors is available for use on the 360, from Occidental Computer.

A "load-and-go" system, the Self-Adapting Report Generator (Sarg) allows the user to specify the report format desired, to list 18 fields, and to accumulate totals on 10 fields, the company said.

Occident said that Sarg provides five levels of control, plus final total. It also generates page headings, and total and group indications, if desired.

Sarg is operational on the 360/25 and above, with 32K storage and two disk or two tape drives, under DOS.

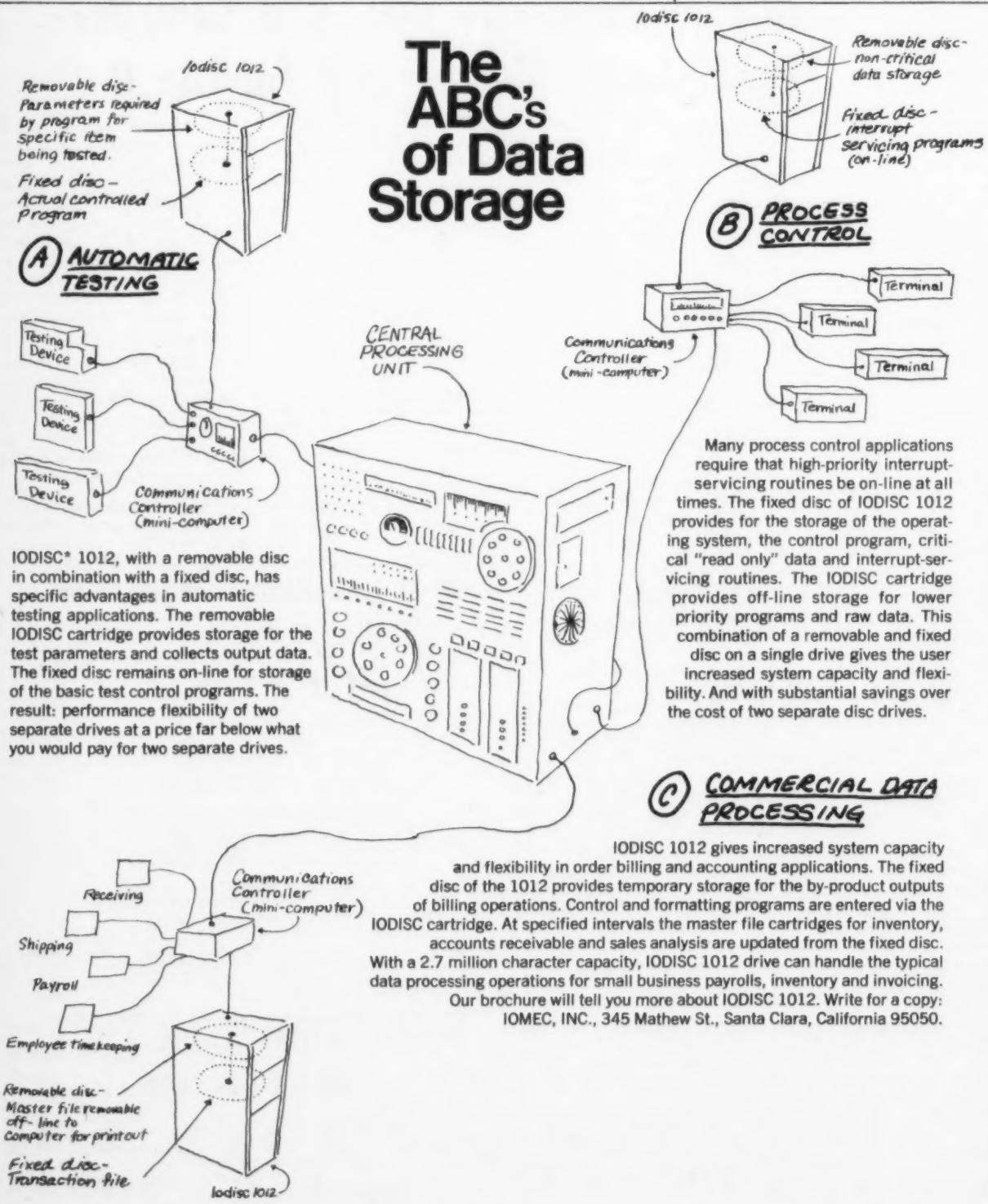
Geared to the EDP-novice, Sarg includes specification sheets from which the program parameters are punched. No programming, as such, is required, although the user has to be aware of the sequence of events within the calculation specifications.

As with other report generators, Sarg provides automatic decimal alignment for arithmetic operations. It also allows input records to be bypassed, selected, and edited according to user-supplied specifications.

The Sarg system sells for $2,500, which includes implementation and user's manuals, in addition to a supply of the specification sheets.

Occidental Computer is at 6600 Jurapa Avenue.

The ABC's of Data Storage



IODISC* 1012, with a removable disc in combination with a fixed disc, has specific advantages in automatic testing applications. The removable IODISC cartridge provides storage for the test parameters and collects output data. The fixed disc remains on-line for storage of the basic test control programs. The result: performance flexibility of two separate drives at a price far below what you would pay for two separate drives.

Many process control applications require that high-priority interrupt-servicing routines be on-line at all times. The fixed disc of IODISC 1012 provides for the storage of the operating system, the control program, critical "read only" data and interrupt-servicing routines. The IODISC cartridge provides off-line storage for lower priority programs and raw data. This combination of a removable and fixed disc on a single drive gives the user increased system capacity and flexibility. And with substantial savings over the cost of two separate disc drives.

IODISC 1012 gives increased system capacity and flexibility in order billing and accounting applications. The fixed disc of the 1012 provides temporary storage for the by-product outputs of billing operations. Control and formatting programs are entered via the IODISC cartridge. At specified intervals the master file cartridges for inventory, accounts receivable and sales analysis are updated from the fixed disc. With a 2.7 million character capacity, IODISC 1012 drive can handle the typical data processing operations for small business payrolls, inventory and invoicing.

Our brochure will tell you more about IODISC 1012. Write for a copy: IOMEC, INC., 345 Mathew St., Santa Clara, California 95050.

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MIP Retrieves Data From Variable Files

HOUSTON – The Multipurpose Information Processing (MIP) system from Dynamic Computer Systems Inc. (DCS), lets non-EDP personnel develop and run their own data collection, tabulation, analysis and reporting applications.

Admitting the similarity to other information retrieval systems, DCS said that MIP has a simpler yet more flexible approach to data base creation and maintenance than the others. Beyond that, DCS said that MIP has a processor module for working with the records in the data bank that is unmatched in its capabilities.

Deviations

The MIP processor can calculate variances and standard deviations, as well as sum and mean of all selected numeric fields. Correlations, time plots and frequency distributions are also possible, the company said, on all data or on any selected segment of the base.

"Across-the-board" changes to all or to selected records allow the MIP user a simulation or modeling capability not generally available in information retrieval systems. With this ability, the user can, for example, see the exact effect of a proposed pay raise for a given job classification, or of a shortened work-week for a particular department.

The data base methodology is also unusual, a spokesman noted, in that it allows variable length records to fit the user's needs.

Batch Environment

DCS said that the present version of MIP operates in a batch-processing environment, but that an on-line version is under development and should be ready shortly.

The present batch version of MIP is priced at $25,000.

Dynamic Computer Systems is at 730 North Post Oak Road.

Editing System Eliminates Verification, Edit Runs

By Frank Piasta
CW Staff Writer

MINNEAPOLIS – A system for data editing and validation developed for key-to-tape installations by the Data Action Corp., is said to eliminate key verification and most, if not all, computer data validation runs.

The system, called the 1500 Data Editor, is intended for use in larger installations. The company estimates that one editor unit would be sufficient to handle the output of 40 to 50 key-to-tape units.

The Editor is designed to be the central unit in a data entry operation incorporating devices that use IBM MT/ST-compatible tape cartridges – including the IBM 50 and Data Action 150 Magnetic data inscribers as well as the MT/ST.

The MT/ST tape is edited, validated and reformatted onto 1/2-in. magnetic tape.

Standard Forms

The machine carries out many standard forms of record editing and validation including data duplication, record resequencing, record expansion, batch totals, range checks, and verification of check digits.

It also reformats output data to meet the user's requirements, enabling him to key input data without regard to output format. In addition, the edit routine inserts constant information, eliminating the necessity of rekeying the data, the company said.

Data can be corrected in two different modes. If a job requires immediate corrections to be made, the record and error are displayed on the console CRT enabling the operator to make the necessary changes by using the console keyboard.

Corrections can also be made in an unattended mode by using a low-speed printer to list exceptions for later correction by a key-to-tape operator. Alternatively, exceptions may be recorded on a separate tape cartridge for correction, while error-free data is written on the output tape.

The 1500 includes a small computer, operator console and as many as four computer-compatible tape units. A low-speed printer, a Teletype 35 RO unit, can be added optionally.

Data Action 1500 Data Editor displays input errors on CRT.

Standard memory capacity of the processor (Lockheed MAC-16) is 8K 16-bit words, expandable to 64K, with a one-μsec cycle time. Eight hardware priority interrupts and peripheral control logic are included.

The operator's panel includes a keyboard, CRT display, control panel, and two tape cartridge units. The CRT has a screen capacity of 960 characters, (24 lines of 40 characters). It is used in operator communication as well as in the error correction process.

The output magnetic tape units may be of mixed speeds and densities. They are IBM-compatible with data recorded in Ebcdic code, 9-track, at 800, or 1,600 bit/in.; or 7-track BCD at 556 or 800 bit/in. Tape drives compatible with Honeywell 7-track 556 and 800 bit/in. units are also available.

Software for the 1500 Data Editor system consists of the Escape application system. It includes an input-oriented language and compiler that generate decision tables, and a second program that translates the tables into machine language.

The 1500 Data Editor, with an 8K processor, is available for $1,700/mo, including maintenance. An output tape drive and the low-speed printer increase the rental to $2,000. Purchase price of the system would be approximately $62,500.

Customer deliveries will begin in October 1970, with deliveries scheduled on a 60- to 90-day basis after that.

Data Action Corp. is at 4445 West 77th St.

Parallel Videojet 9620 Printer Interface Allows Use With Minis and Data Lines

CHICAGO – With the availability of a parallel interface for its Videojet 9600 non-impact, ink-jet printer, the A.B. Dick Co. has transformed it into the 9620 – a low-cost data processing peripheral.

The nearly silent printer can now be directly attached to most Usascii data source terminals and minicomputers. The unit had previously been limited to applications involving a serial interface, such as Bell Dataphone devices.

The basic parallel interface is said to be easily connected to presently used software, the company said. It uses the "set flag, reset flag" concept to communicate with the software system. When the printer is ready to accept a character, a flag is set in the interface. The data source then presents the character on eight data lines and strobes it into the printer with a pulse on the strobe line. The printer then resets the flag. Interfacing is said to be simplified through the use of DTL/TTL voltage levels and impedances, and standard Usascii code.

A party-line concept is said to allow a single data source to support up to eight printers through one I/O controller. This party line feature includes bi-directional data/sense lines, lateral and longitudinal parity and remote power control.

The Videojet 9600, upon which the 9620 is based, [CW, Feb. 2, 1970] is a low-cost printer with virtually silent operation. With its silence and 250 char/min print rate, it is designed to be used in applications where noise is objectionable and a high rate of printing is required.

The Videojet printer is designed for installations where a conventional printer would cost more than the CPU, the company said. A drawback of the unusual device is that carbon copies cannot be produced.

The parallel interface adds $740 to the $6,250 price tag of the Videojet printer. Currently, the Videojet 9620 is on a 30-day delivery schedule.

The A.B. Dick Co. is at 5700 W. Touhy Ave.

Low-Cost CRT Unit From Tektronix Features Speed, Editing Ability

BEAVERTON, Ore. – A new CRT-based computer peripheral from Tektronix combines speed and low cost.

The T4005, intended for use in displaying high-density alphanumeric and complex graphic data, is composed of two parts – a Graphic Display Controller (GDC) and an 11-in. Direct-View Bistable Storage Display Unit. The GDC contains the operator controls and the hardware which processes computer outputs into the data required for display.

The GDC hardware performs a number of editing functions such as scaling, offsetting, magnifying, framing and augmenting. These functions are often done with software in other systems, Tektronix said. The GDC hardware is said to minimize core storage requirements and program changes to obtain initial results. Another advantage claimed for the GDC is its ability to drive four distinct display devices under both manual and software control.

The display device is a storage tube which retains the display after it is written once. This device provides a flicker-free, drift-free display, according to Tektronix. Computer outputs are displayed without the impact and positioning noise of mechanical devices, such as printers. In many cases, according to Tektronix, the display rate of the storage device is faster than the computer algorithms producing the display.

Several features of the device are claimed by the firm to be unique. These features include display scaling, zooming, augmenting, ability to drive multiple displays, several convenience controls, multiple software and interrupt controls, status indicators, and positioning controls which offer two methods for positioning a portion of the display.

The T4005 can be interfaced to most computers and is supported by extensive software for plotting, character generation and text handling, the firm said.

The price of the T4005 Graphic Display is $7,850. First customer shipments are scheduled for the third quarter of 1970.

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Keypunch Replacements—Part IV

Shared Components Result in Lower Cost per Station

By H. Edward White
Special to Computerworld

All of the "standalone" systems carry the cost burden of a complete set of electronic and programming controls along with a tape handler for each keyboard. Less costly systems can be built by "sharing" electronics and recorders among a number of keyboards. In addition, such systems eliminate manual tape handling for "pooling" data from several operators.

During the past two years over 30 companies have developed keyboard-type data recording devices designed to replace keypunch equipment. Apparently these companies believe that many of the estimated 400,000 keypunch and verify devices installed in this country will be replaced by their equipment.

But how valuable are these new devices to the keypunch user? Are they cost effective? Do they increase efficiency?

In this series CW explores the advantages and disadvantages of the keypunch replacement devices.

Seven companies believe that they can show a better system this way. They are: Addressograph (manufactured by Computer Entry Systems), Entrex, Friden, Inforex, Mohawk Data Sciences, Sanders Associates, and TEC.

Friden, like Mohawk, also offers a "standalone" system in the computer-compatible tape group. Their machine is designed in a modular fashion, and a varying number of keyboards can be connected to a single tape handler, depending upon system requirements. Capabilities do not go beyond the "standalone" systems, but the cost per station can be the lowest of any of the key-to-tape devices.

Balance Totals

Mohawk's entry into this group can provide balance totals and record counts, in addition to just plain data recording. There is more than one tape handler on the central processor, which means that the data from different applications can be kept separate.

The cost at 16 stations runs about 30% less than Mohawk "standalone" systems. The Mohawk control processor can also read paper tape, punched cards, and has communication capability, all optional.

If you feel that a separate tape for each operator is important, Addressograph has it. The cost is about 20% less than "standalone" systems at six stations. The system has the options of interfacing directly into your computer (no tape handling at all), or "pooling" automatically onto a single tape after all data is recorded and verified. A CRT is optional at each station.

Separate Data

How important is it to keep the data separate for each operator? If you feel that it is, you might like each operator to record on a single disk, and verify from it. In that way, you can "pool" onto a single tape as each application is completed, no matter how many different operators worked on it.

Inforex and Entrex have just such a system, complete with a CRT for each operator. At eight stations, the price will run about 40% below "standalone" systems. In addition, Inforex offers balance totals and some data editing.

If you believe that CRTs are a good way to guide the operator and reduce errors, Sanders Associates has a 1,000-character CRT. It can be used to display a "form," with the operator filling in the blanks.

Like Mohawk, several tape units are used among a dozen stations; the data for a given application goes onto the same tape, even though prepared by several operators. The Sanders system costs about 10% more, at 12 stations, than "standalone" systems.

If you like the Sanders concept, but need about 32 stations, look at TEC (formerly Transistor Electronics Corp.). They offer "big screen" television as an option, but "pool" onto a disk. Lower cost operator stations (no CRT) can be used "intermixed" in one system. The cost per station can be low for this group, depending upon equipment chosen.

Minor Problem

Since these systems have so many features at prices below the "standalone" variety, why doesn't everybody buy them? There is one minor problem: If the central processor goes down, the whole system is down, and from eight to 64 operators are on coffee break. One hour of down time in an eight-machine system is one "girl-day" lost.

Imagine this happening just before payroll time! This does not mean that these systems do not have a place – they do! Just be sure that you and the manufacturer have an understanding about what procedures are followed when downtime occurs. Plan for the emergency. The manufacturers do have plans that are reasonable for many circumstances.

Another group of manufacturers saw the advantages of hardwired systems, and said, "Why not have a minicomputer control the system. In this way, substantial editing, reformatting, and operator error control and development of performance data can be achieved." They did, and next week we'll explore the "hardwire to minicomputer" group.

H. Edward White has been an independent data processing consultant for the past seven years. He has had extensive experience with data recording and communications equipment, and is currently manager for corporate planning at I/O Com Inc.

Delta Data Has Interface

CORNWELLS HEIGHTS, Pa. – Delta Data Systems Corp. has available an interface for its Delta 1 video terminal.

The interface adds $1,000 to the price of a Delta 1 display. Delivery is 60 days.

Delta Data Systems Corp. is at Woodhaven Industrial Park.

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EIA Committee to Study 'Netting' Problems for DoD

By Phyllis Huggins.
CW West Coast Bureau

SANTA MONICA, Calif. – "Netting" computer systems is the ability of all computer systems within a government agency or a corporate structure to communicate with each other on a cooperative basis. The Department of Defense (DoD) recently commissioned the Electronic Industries Association (EIA) to set up a committee and study the feasibility and problems of netting. The 53-man committee represented every interest involved including computers, communications, modems, peripherals and users. The chairman was Marc Bendick, Engineering and Systems Evaluation Department manager at System Development Corp.

In an interview, Bendick said the forces pushing netting are the need to get greater returns from the investment in computer systems for all users, not just the Department of Defense, and a greater need for effective use of economic assets.

Netting makes it possible for a user to make use of time available upon other computers within the network when his system gets overloaded.

Current practice is to order a bigger, faster and more expensive computer. Netting helps equalize overload and underload conditions for installations within the same organization.

Another factor is the need for back-up facilities on an emergency service capability basis.

While netting seems like a solid virtue, there are problems which do not encourage rapid acceptance. Bendick estimates that only 2% of today's systems employ netting and by 1980 only 20% will.

He further speculates that future acceptance is dependent upon what the fourth generation of computers is. "If it is minicomputers, it may be cheaper to have just a standby computer rather than go through the criteria required for netting."

Bendick feels a number of problems are currently blocking netting developments. Foremost of these are vested interests. "This is the most difficult problem. For example, the finance officer wants to have his data base in his particular form and with autonomous use of the computer. The time, freedom and independence of individual groups require a strong override authority to keep them interoperable."

The second problem is the need for this strong management override authority for configuration management. This is the ability of management to control changes in all the users of the network involved so that they conform to standards that permit interoperability. Bendick feels that such strong management is available within the industry on only a limited basis.

Third Problem

A third problem is the development of required standardization of physical components and systems components – transmission, modems, input/output, data bases, etc. The difficulty of this problem is exemplified by the numbers of independent organizations all involved in telecommunications standards.

The committee's survey showed at least 21 such groups within government and industry. Bendick pointed out that unlike Japan and European countries where they have industrial cartels that keep a strong control on standardization, "we" believe in a rambunctious competitive situation.

He said this might be adequate until the "ultimate" in computers and software is reached, but that it presents problems for maximum utilization of efforts and also handicaps our competitive efforts in those countries.

Communications

Incomplete Standards

The committee found that standards available today in the areas of EDP and communications netting are incomplete and, in some cases, they are overlapping and contradictory, while in others they are obsolete.

Also, the lack of standards in terminology used by the Armed Forces creates unnecessary problems for interoperability. There also is the very poor purging techniques for standards. Once a standard is established it is almost impossible to get rid of it.

On an economic basis, the cost of netting has to be carefully considered as the cost of the communications portion of a netted system can be significant and must be evaluated against the cost of standalone systems accomplishing the same tasks.

Arpa Supports Study

While the problems for netting are considerable, work is being done by government and industry to make it more generally feasible. For example, the Advanced Research Projects Agency (Arpa) of the Department of Defense, is supporting a study to net 20 separate systems involving different computers, configurations, speeds, sizes, word lengths and languages. Industry is producing special communication modems and special computers which make netting more technologically possible. Systems incorprating these techniques are just beginning to emerge.

Data communications helps enforce the law and protects the public.

Next time you're moving information, remember— no one knows more about moving it than the people who run the world's largest communications network.

AT&T

Ellinghaus, Cox Fill Top Slots

NEW YORK – Recent shifts in communications personnel have affected the Bell system and Microwave Communications of America (Micom).

William M. Ellinghaus, former executive vice-president of AT&T, has been named president of the New York Telephone Co. succeeding Cornelius W. Owens.

In moving to New York Bell, Ellinghaus who joined the Bell System in 1940 will assume responsibility for the AT&T operating company most affected by recent increased demand for data communications facilities.

Kenneth A. Cox, former member of the Federal Communications Commission, has become a senior vice-president of Micom. In the new post he will be responsible for coordinating legal aspects of applications before the ICC filed by Microwave Communications Inc. (MCI) and its affiliated companies.

Micom is setting standards for the MCI data network that has been proposed to offer facilities in direct competition with Bell to data users. The first link in the MCI network was approved last August by the commission.

EUROPE TODAY

Issue 16. A ménage à trois in Europe for CDC, ICL and CII -- after months of saying we're only good friends, ICL (UK) and CII (France) admit to a serious flirtation but CII, with typical French coquetry, is also holding hands with CDC. EDP Europa Report examines the affair and the same issue takes a brief look at the Danish market.

Order your copy of EDP Europa Report Issue 16 now, at the non-subscriber price of $5, £1.75 (£1. 15s) USA, $3.35, £1.40 (£1. 8s) Europe, and have its full value accredited to an annual subscription for 24 issues $65, £27 if taken up within two months. Orders may be placed at either of the following offices.

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DEC Unveils New Educational Leasing Policy Covering PDP-8/L and PDP-8/I

MAYNARD, Mass. – A new educational leasing policy has been announced by Digital Equipment Corp (DEC).

Under this policy, the educational institution is offered a 4,096-word, general-purpose PDP-8/L or PDP-8/I small computer, teletypewriter, and a variety of program packages for as low as $400/mo, including maintenance.

The minimum rental period is twelve months. DEC permits 70% of the accrued rental charges to be applied toward the outright purchase of either computer during the first year of the lease.

During the second and succeeding years of the lease, 60% of the total payments made may be applied toward the purchase of the computer. For example, a lessee who decides to buy his

Education

computer after two years of leasing is permitted to subtract 60% of the two-year rental payments from the purchase price.

Base price of the PDP-8/L is $8,500; and the PDP-8/I, $13,450.

A variety of configurations are included in the leasing package. For $400/mo, the secondary school, college, or university can rent a single-user PDP-8/L computer with teletypewriter; and for approximately $1,000/mo, a five-user PDP-8/L based T/S configuration is available.

All configurations offered can use either Basic or Focal.

A five-user PDP-8/L or PDP-8/I-based time-sharing system permits programs of up to 50 statements long to be written or when operated by a single user; the same system can be used to generate 200-statement programs.

52 Association Sets Guidelines For Handicapped

By Harvey Elman
CW Staff Writer

NEW YORK – Course constraints for the training of physically disabled computer operators were developed at the recent educational symposium sponsored by the 52 Association at the Belmont Plaza Hotel.

The purpose of the symposium was to standardize the association's total training effort under "Operation Computrain" and to write a new, more advanced curriculum.

The course, according to Allan Weinberg, executive director, will be more comprehensive than the standard courses now being offered publicly to the able-bodied individual.

Weinberg maintains that the trained physically disabled operator or programmer may obtain maximum usage of equipment, thus producing the most cost-effective operation for the manager [CW, Aug. 5].

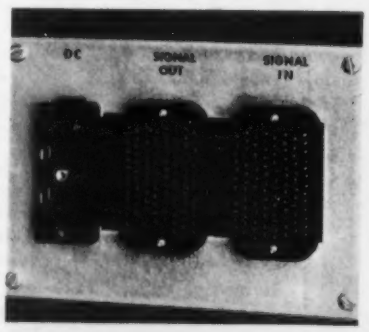
Under the guidelines, the graduate must be able to perform job entry level functions. Personal qualities and skills which make the graduate readily employable and capable of holding a job in a competitive commercial environment are required. Career advancement beyond the entry level should be sought.

The graduate must be able to operate an IBM 360 under DOS control. Specifically, this involves using the console typewriter, card reader-punch, printer, and disk and tape drives. Normal EAM equipment, such as the keypunch and sorter, must be operated.

The course is intended to prepare entry level operators for departments which use IBM 360/30s or larger systems, or equivalent equipment.

The IBM 2314 is a slower, more expensive replacement for a CDS 114/1014 disk storage system.

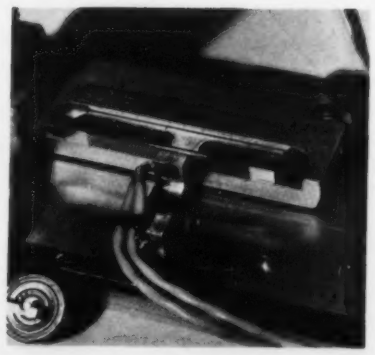
The CDS 114/1014 and the IBM 2314 direct-access storage system do the same work. They're plug-for-plug replacements for each other, they use the same recording format, and you can intermix libraries between the two and never know the difference.



The CDS 114/1014 and the IBM 2314 are plug-for-plug replacements for each other.

But there is a difference.

The CDS 114 gives you data transfer rates of 312,000 bytes per second, track-to-track access of 12 msec, and average access time of 35 msec. The 2314 (according to latest published manufacturer's specs) gives you 25 msec. track-to-track, and 60 msec. average access.



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And, of course, the CDS 114 has our electromagnetic positioning system which uses no mechanical pawls, detents, gears, or optical devices. Head position is sensed by a fixed variable-reluctance transducer mounted near the rack face. It's the most reliable and accurate system there is because you can't wear out an air gap.

The CDS 114 plugs into a 2314 controller, or you can get it with the Century Data 1014 controller. The CDS 1014 controls eight on-line drives and one off-line spare, and is completely interchangeable with the 2314 controller for any system 360/30 or larger.

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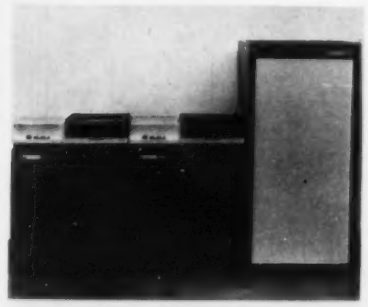

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Acpa Plans to Recruit 12,000 Members

By Harvey Elman
CW Staff Writer

NEW YORK – The newly formed Association of Computer Programmers and Analysts (Acpa), which will devote itself to upgrading the professional skills and qualifications of its members as well as improving

Societies

working conditions, expects to recruit approximately 12,000 members in its first year.

Paul Notari, formerly of Bema and now the appointed president of Acpa, said: "Two other professional associations in existence profess to represent the analyst and programmer, but in all honesty they only represent very select segments of the profession."

"The ACM is too sophisticated," he continued. They're all academicians, many from NYU, Columbia, and the like. It's a scientific membership which has failed to achieve a commercial program in the last five years. That's why we don't want any academicians on our board of directors, just practical programmers who offer technical support," he maintained.

"The DPMA is manager-oriented and Cal Elliott's major problem is that the hierarchy is plagued by his board of directors – they're holdovers who lack a technical DP background," he noted.

What will Acpa do to help its members?

"First, we'll establish direct liaison with manufacturers to influence the design of future systems and equipment with consideration of the elements involved. Application will be made for membership on Ansi's X3 DP standards committee to have our collective voice heard on all standardization matters.

"We hope to establish rigid membership qualification standards and conduct meaningful education programs. Then we'll launch an extensive PR campaign to convince upper management that EDP operations must be managed by EDP professionals," he said.

Initial funding has come from the current nine-man board of directors headed by William Newell of Complex Systems Inc. The directors, who founded the association, will maintain two-year terms of office. Dues will range from $15 for associate members to $35 for senior members.

Notari may be contacted at Suite 1500, 2 Penn Plaza, New York, N.Y. 10001.

Canada Business Show Expects to Draw 30,000

TORONTO – Forums to discuss effective and profitable use of computers for management needs will be provided by seminars at the combined Canadian National Business Show and Data Processing Conference Oct. 5-8, at Exhibition Park.

"If we can resolve some of management's problems in dealing with their DP departments, then they can have the benefits of more profitable management systems," noted W. Gary Glover, president of Control Data Limited and chairman of the seminars.

The three seminars will focus on organizational structure for effective computer utilization, the rapid growth of time-sharing facilities, and the rapid developments in computer input/output and the accompanying management decisions.

"Canada's largest computer show ever" expects to attract upwards of 30,000 businessmen for the combined Business Show and Conference, sponsored by the Canadian Business Equipment Manufacturers Association.

Users Are Speakers

"Our speakers, who are users rather than manufacturers' people, will be discussing their topics in terms of the management decisions necessary to making computers work for them," stressed Glover.

Admission is free and tickets are available from the show office at 1819 Yonge St., Toronto.

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ACM, Commerce Department to Sponsor DP Conference at Japan Trade Center

NEW YORK – ACM and the U.S. Department of Commerce will cosponsor a technical conference to run concurrently with an exhibit of U.S. computers, peripherals, and services in Japan at Tokyo's International Trade Center at Harumi Pier, Oct. 12-17.

The three and one-half day conference and exhibition is the first U.S.-sponsored event of its kind to be held in Japan. The event is expected to attract many top-level persons from Japan's business and technical community.

MIT Prof. Jerome Saltzer will lead a session to explore the state-of-the-art and current thinking on interactive terminal-oriented computer systems. A panel will comment on benefits from network interconnection, services offered by commercial time-sharing businesses in the U.S., and the practical problems involved in getting a full-scale, advanced time-sharing system into operation.

Objectives

The session on management information systems will deal with objectives, concepts, organization planning, and management's role in developing and implementing a management information system. Charanjit Lohara of Eastalco Aluminum Co. will lead the session which will also cover problems of software and hardware.

Dr. George Michael of Lawrence Radiation Lab will lead a session on data structures for interactive graphics, languages, and artwork generation.

Computer standards, a major question in the industry, will be discussed by a panel led by Dr. Herbert Grosch of the National Bureau of Standards.

A session on terminals and peripherals will be led by Charles French of Viatron. The latest advances and problems and some expected developments in this area will be covered.

Dr. Emil Borgers of Redcor is responsible for the session involving the impact of minicomputers.

Data Management

Data management aspects of operating systems, communications and terminal interfaces, and problems of multiprocessor systems will also be discussed.

Program Chairman Dominic Laiti, vice-president of KMS Industries, said that participation is by invitation "to insure technical content of the highest quality." One or more "highly recommended" Japanese will make presentations in each of the sessions.

A program booklet containing abstracts of the session and of each presentation will be published before the conference.

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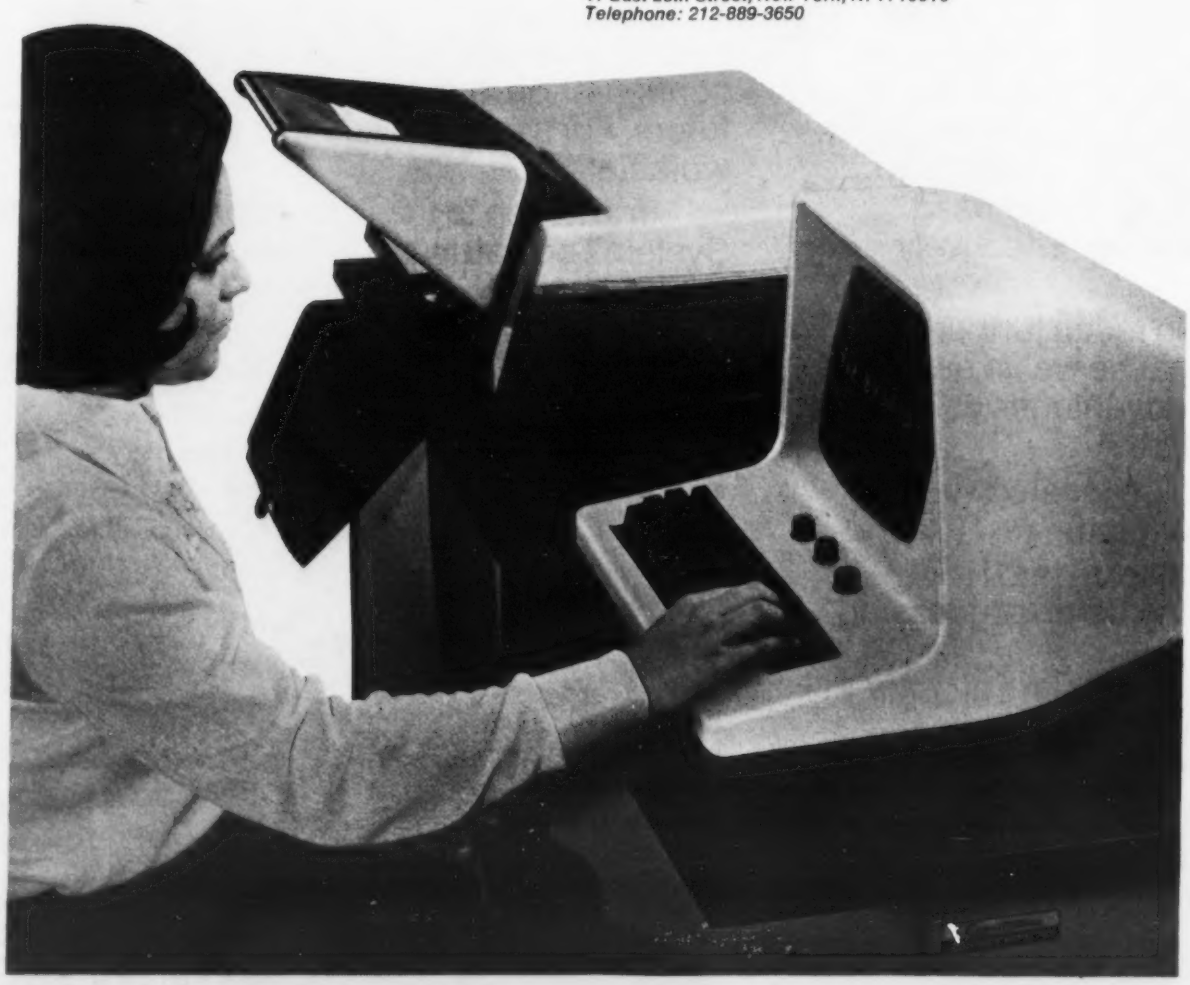


Mark IV Users Group Praised

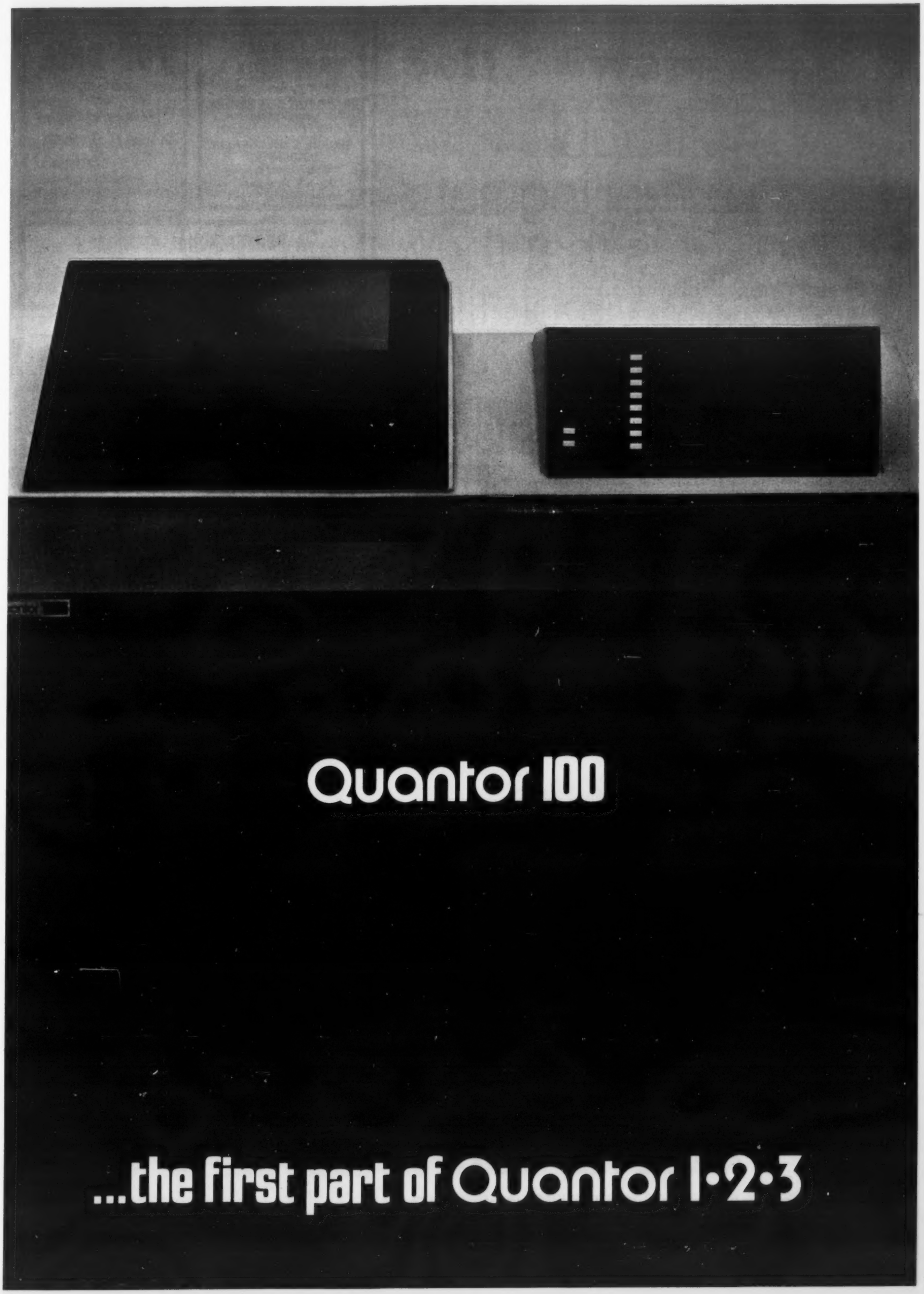
TORONTO – The eighth and largest meeting of the only computer software users group, held here recently, was termed an "outstanding success" by the president of the Mark IV Users Group (IV League), John Thurlow of Esso Mathematics & Systems.

100 Representatives

"Of the more than 300 Mark IV installations throughout the world, over 100 sent representatives to our first international meeting. Participation and interest in the technical sessions were very high," he concluded. The IV League (Ivy League) meets semiannually for three days in the summer and the winter to promote mutual education and to exchange Mark IV experience and ideas between users. Mark IV is a general-purpose software product for business data processing developed and marketed by Informatics Inc. of Canoga Park, Calif.

Race Committees Automated

SAN FRANCISCO, Calif. – Race committees are determining winners of yacht races by inputting handicap information and start and finish times into a computer.



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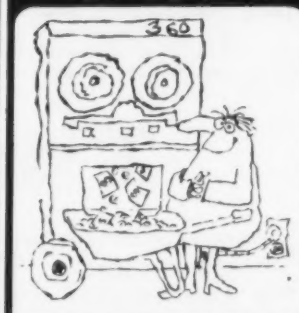

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September 16, 1970

S&Ls Seen Switching To On-Line

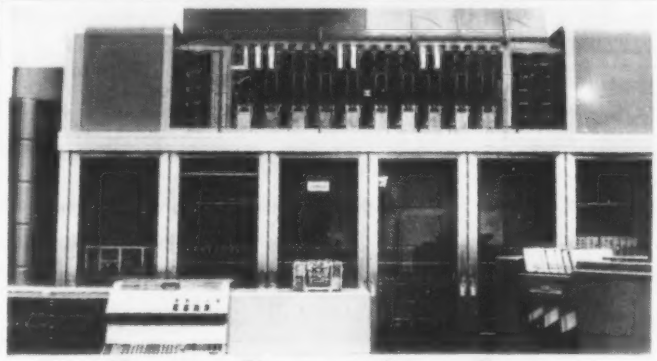
NEW YORK – Almost 25% of the savings and loan associations with assets of over $25 million have in-house computer systems, according to a survey of 1,411 savings institutions announced recently.

Charles Borsom, who serves as the executive vice-president of the National Society of Controllers & Financial Officers of Savings Institutions, reported that an additional 45.3% of the S&Ls surveyed presently use a service bureau.

Most of the S&Ls are considering conversion to on-line type of computer operations where transaction entries at teller windows are automatically entered into the system, Borsom told the recent ACM '70 conference.

At present, he said, there are more than 32,000 teller stations in savings associations, but only 7,000 have some sort of on-line teller terminals, with only a small percentage of them being "second-generation" teller terminals.

The report noted that many of the Federal District Home Loan Banks are beginning to enter the field as suppliers of remote computer services.



Core Capacity Cut

The Electronic Memories Sems 5-core memory system shown on the table in the foreground has the same storage capacity as the historic Johnniac computer behind it. The memory of the Johnniac, developed in 1955, takes up the entire top portion of the computer – approximately 6 ft in width and 2-1/2 ft high.

EM Showing 3-Wire 3D Core Memory

HAWTHORNE, Calif. – A 3-wire 3D core memory system from Electronic Memories is said to combine the performance of 2-1/2D systems with the dependability and cost advantages of 3D systems.

According to Memory Systems' General Manager, Thomas J. Gilligan, "The Nanomemory 4850, with an 850-nsec cycle time and 350-nsec access time, is a little slower than our 2-1/2D systems with 500 and sub-300 nsec cycle and access times, respectively.

"The 4850 is also less expensive than 2-1/2D units. Prices in large capacities are approximately 3 cents to 4 cents per bit for the 4850 versus 5 cents to 6 cents per bit for comparable capacity 2-1/2D systems," Gilligan added.

Word lengths in the Nanomemory 4850 range from eight to 40 bits, in 5-bit increments, with core capacities of 4K, 8K, 16K and 32K words. Storage capacity can be expanded in the field because of the construction of the memories; core memory stacks and associated electronics are on plug-in cards or modules. This construction is also said to improve maintainability.

Ruggedness Seen

The 4850 also offers, according to the manufacturer, a degree of ruggedness and reliability not commonly found in commercially priced core memory systems. High-speed silicon integrated circuits are used throughout and 2-mil lithium cores are said to provide stable switching speeds over a temperature range of 0° to +55°C.

Laminated finger joints are used in the stacks to eliminate riser wires and are said to reduce the number of solder joints by 50%. A solid aluminum substrate is used beneath each mat of cores, which are bonded to the substrate, to achieve better thermal characteristics.

The 4850 is in production and is currently available on a 60- to 90-day delivery basis.

Electronic Memories, a division of Electronic Memories and Magnetics Corp., is at 12621 Chadron Ave.

NRMA Suggests User Be Given Choice Of Methods to Hook Into Toll Exchange

By Alan Drattell
CW Washington Bureau

WASHINGTON – The National Retail Merchants Association (NRMA) has asked that users be given a choice of methods in hooking into the toll exchange network.

NRMA's suggestion came in response to the Federal Communications Commission request for comments on a study by the National Academy of Sciences entitled, "Report on Technical Analysis of the Common Carrier/User Interconnections Area."

"As a means of promoting innovation," NRMA said, "and to prevent actual or potentially discriminatory costs and delivery practices, an interconnection policy based on alternative methods should be adopted. Under such a policy the customer would be free to choose that particular method most appropriate to his requirements."

The organization offered two optional methods: "(A) Common carrier-provided and maintained interconnection arrangements; (B) Interconnection arrangements and/or equipment available independently certified by the Commission and installed and maintained by competent personnel."

Commissioned by FCC

The NAS report on the problems involved in the interconnection of customer-owned equipment and telephone company services and facilities was commissioned by the FCC. The report was seen by the FCC as an aid in helping it to evaluate questions raised by tariffs filed by the phone companies in response to commission orders in the Carterfone case. This two-year-old landmark decision allowed for interconnection of non-Bell attachments on transmission lines.

The NAS report concluded that "uncontrolled interconnection to the common carrier network . . . would be harmful."

According to NRMA, "Many of (its) constituent retail stores have an ever-increasing need for extensive in-house systems which must have access to the common carriers' toll exchange network. Thus, it follows, that, if interconnection cannot be achieved on a reasonable basis, the adverse effects on retailers would be serious and far-reaching.

". . . There have already been numerous post-Carterfone (Decision) reports from retailers as to lack of suitable interconnection arrangements with the Bell system occasioned by prohibitive cost factors, equipment unavailability, or lack of meaningful cooperation. NRMA, therefore, submits that the common carriers should not have the exclusive right to provide interconnecting equipment or arrangements to the end-user."

As expected, American Telephone & Telegragh Co. and Western Union Telegraph Co., in their filings, endorsed the National Academy of Sciences' report.

'Flux Ring' Said to Better Core, Planar, Plated-Wire Memories in Cost, Efficiency

VAN NUYS, Calif. – Flux Ring, described by Signal Galaxies, Inc. as a new approach to thickfilm memories, is said to better core, plated-wire, and planar memories in cost and performance.

The heart of the memory is a planar array of thickfilm elements providing storage for 8K to 32K bits with up to 16K elements in a four-in. square.

According to the manufacturer, arrays with up to 64K bits in a single memory stack or array (two 32K bit arrays back to back) will be offered in the late fall. These can be easily assembled into million bit memories by users, the company said.

Two adjacent memory elements per bit are used in the memory and result in 100% redundancy, since, although the failure of one of the two elements will cause a degraded output of that element, the remaining element will still function as a storage unit.

The name "Flux Ring" was derived from the manner in which the planar elements are deposited in the center of a toroid. Because of the material used, flux from the film elements finds a lower reluctance path in the ring than in the air.

Used for Readout

The perpendicular magnetic field generated by a unipolar current can be used for readout in the rotational mode and in conjunction with a smaller digit field applied perpendicularly, for storing binary zeros and ones. The conductor used for the digit field can also be used for sensing.

Writing is accomplished by rotating the magnetization of the element with the word current so that it is nearly perpendicular to the preferred direction. The application of a digit field tips the magnetization in a 1 or 0 state, depending on the digit current direction.

To read a bit, the word current is applied to the selected line. The magnetization is then rotated away from the preferred direction and a voltage is induced in the sense line. Users can organize it as a 2D or 2-1/2D memory, depending upon how their electronics are configured.

Self-Cancellation

The complementary bit structure and uniformity of the plane are said to insure self-cancellation of common mode noise, described as one of the most troublesome problems in most memory techniques.

A further advantage of the Flux Ring is "Magnetic Closure," a proprietary technique claimed to provide nonvolatility of memory bits by locking the elements in their magnetized state in case of power failure.

Output voltage is independent of word current direction. Word drive currents are lower for Flux Ring than for plated wire. For example, Flux Ring word drive currents are approximately 450 mA as opposed to 900-1,300 mA for plated wire, thereby permitting the use of smaller word-select transitors. Rise times in the Flux Ring memory are typically less than 10 nsec. Aging in conventional planar film memories is usually evidenced by an increase of skew and dispersion. Since with the Flux Ring, these are mechanically defined parameters, there can be no change in them and the output flux available is greatly increased, the firm said.

Signal Galaxies is currently producing 8K bit arrays (128 by 64) and 32K to 64K bit stacks for evaluation. These can be used with standard 50 mil center connectors. Price is approximately 7 cents to 1 cents per delivered bit at the array level. Delivery is 90 to 120 days.

Signal Galaxies, Inc., a subsidiary of Signal Companies, is at 6955 Hayvenhurst St.

Price Changes Are Announced For GE-PAC

PHOENIX – GE's Process Computer Department has announced price adjustments on GE-PAC 4010 and 4020 process computer equipment, which is not included in the forthcoming Honeywell merger.

The major effect of the adjustment is a 7% price increase applied to all GE-PAC 4010 and 4020 hardware, software, and contract maintenance and manpower rates, except for hourly rates for product service which remains at $25. The price increase is now effective on all orders for equipment to be delivered after July 1, 1971.

L.E. Bret, department general manager, stated that increased labor and material costs made the price adjustment necessary. For GE-PAC 4010 and 4020 users employing free-time software systems, a 25% surcharge will be added to the monthly system maintenance charge.

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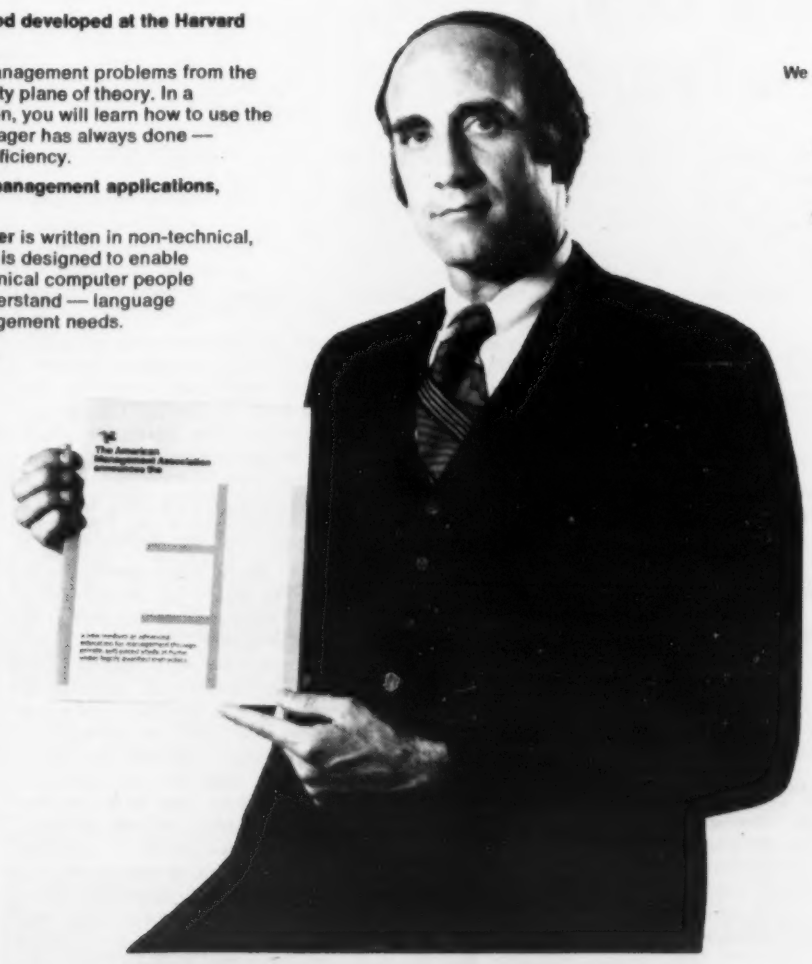

***Management and the Computer* is recommended by Computerworld**

We have often seen consultants' reports which relate the success of computer utilization to the degree of top management participation in defining the systems requirements.

And since the full impact of the computer has yet to be felt on management operations, it is equally important that a thorough understanding of modern management techniques and objectives exists at all levels of management.

Computerworld is pleased to recommend **Management and the Computer** to its readers as an effective aid in preventing a communications gap between top management and data processing executives.

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Process Control in School

How to control repetitive machine tools is being taught students at Mohawk College of Applied Arts and Technology in Hamilton, Ontario, Canada, by means of a DEC PDP-12, left, and the company's PDP-14 solid-state machine controller.

Van Praag Analyzes Economic Slump, Cites 'Premature Dropout' in Industry

By Phyllis Huggins
CW West Coast Bureau

LOS ANGELES – "We are seeing a premature dropout in the industry. I know a lot of good guys who are out," said Vincent A. Van Praag, veteran of the computer industry and management consultant.

"We are having horrendous money problems. My advice to companies is to play it as though they would never get another cent except from sales."

Pointing out some of the disastrous affects of the current economic situation, Van Praag noted the IBM stock had dropped 150 points in a relative few months, Ross Perot's EDS is now under 20% of value and CSC is under 15% of value.

"What are the causes of this? The high cost of money, not just the economy. The Nixon Administration approach to inflation is a classic one but it is really taking it out of the hide of the small businessman. Everybody suffers from a shortage of money. No one benefits. But the question to ask is who is hurt the least.

"This is the company who has the business and can finance his own growth out of his own profits. If you have a rapidly expanding or contracting company you have to have financing and prices that are exorbitant. I could show you company after company that if you cut their interest rates in half they'd be in the black.

Weather the Storm

"The big companies can weather this situation. They are hurt the least and the crunch serves to eliminate or seriously cripple what could become viable competition for them."

Aggravating the problem is rapidly changing technology. Van Praag observed that at the recent Wescon Show, Motorola was showing a "do-it-yourself" modem kit selling for $39 while until recently the cheapest modem you could get was $400.

"What makes this possible is putting all the electronics in one chip. How would you like to be competitor with a $1,500 device and have one come out for $300? The price of a chip was $170 in the beginning of 1970; it's expected to be $35 in 1971.

"One of the problems of today is the rampant race for economy, indeed the battle for survival. Companies are lopping off essentials that may well put them out of business in three years. They've got to keep technologically on top of things."

According to Van Praag: "Today's economy really makes big brother bigger. IBM has never been a technological leader, but a follower. The user loses in this type of climate because he's eternally paying the higher price.

"If you are the courageous, small user who wants to cut costs and you and your boss buy a small company's disk, big brother goes to your boss and says, "But are you buying a Hudson? They may be out of business in a year."

Univac to Supply Amex With Hardware For Floor Derived Clearance System

NEW YORK – Univac has been selected as the vendor for computer hardware used in the American Stock Exchange's Floor Derived Clearance System (FDC).

The contract estimates development costs at approximately $3.7 million while operating costs estimated at $331,000 per month when the full system is operational.

Delivery of the hardware is expected to begin in December, according to Ralph S. Saul, president of the Exchange. He indicated that development work had been underway for several months and that the full system should be operational by early 1972.

The computer hardware involved in the lease agreement includes: Two Univac 494s, each with a total of 65,000 words of core memory; two magnetic tape subsystems to store files of compared trades; two large drum-type random access memory complexes for storage of trade data; and two 9300 small-scale computer systems to provide punch-card, card-reader and line-printing capability to the overall system.

In addition to the lease of computer equipment, the Exchange letter of agreement with Univac provides for a joint Amex-Univac team to complete systems analysis and write specifications for FDC, and to produce the necessary programming.

Full Backup

Installation of dual processing and storage systems will provide full backup in the event of malfunction in any element. The FDC system can handle daily trading volume of 10 million shares, and peak loads of 20 million shares.

The most important benefit of FDC for member organizations will be the automatic entry of trade data to the Clearing Corp., making it unnecessary for firms to prepare separate input of trade data, as is done currently.

Under the new system, at the time an execution report is teletyped to a member firm from its floor booth, off-floor communications lines will route the data to the Amex communications system, which will switch it electronically to the FDC central processing unit. There, the data will be compared with the opposite side of the trade. Trades that do not compare will be printed out on the Trading Floor shortly after the execution, and returned to the broker, or brokers, involved for immediate resolution.

Transaction reports of member organizations that do not use teletypewriter systems, and of stock specialists will be entered into the system by input devices on the floor. All Amex member organizations will participate in FDC.

FDC is designed to capture clearing data from member firms' booths immediately after the execution of an order on the trading floor of the Exchange and provide for the input of complete, compared trade information direct to the Amex Clearing Corp.

Saul said: "Priority status has been given to FDC in the Exchange's automation program in order to provide important operating efficiencies and cost benefits to member organizations in the shortest possible time."

Cost Factor Cited

Survey Says Managers Oppose Control Systems

LOS ANGELES – Management control systems – especially computer-based control systems – are coming under increasing attack by the managers they are supposed to serve.

Robert V. Morse of Hollander Associates found that a survey of project management personnel in both commercial and government applications uncovered everything from "disenchantment to outright violent opposition to management control systems."

However, Morse indicated that there was also a reticence among the users of such systems to speak out openly against "the sacred cow of government control and reporting requirements" or to take a position "questioning the validity and worth of a modern computerized system" among those he interviewed.

One of the main arguments against the systems was that of cost, with some managers estimating that it cost between 5% to 7% of the overall project cost to maintain a Pert or Pert/cost type of system.

If management relies too heavily on the projections that are made from faulty or overly optimistic data, whole projects can be delayed or even scrapped, he added.

Even if the input is correct and therefore the projections made by the computer programs, when a manager is inundated with a 3-ft high computer printout he will not use it and the effort is wasted.

Mitsui to Install Communication Network Plan

NEW YORK – Mitsui & Co., Ltd., one of the world's largest trading firms, will install a fully computerized global communications network linking 115 Mitsui offices in 69 countries.

An RCA Aircon Message Switching System is the heart of the new Mitsui network. Univac computers in Tokyo and Collins computers in London will be tied into the Aircon computer system in New York via RCA Globcom international coaxial cable and leased satellite channels.

Uchida Masaru, president, pointed out that the 67 lines involved in the Mitsui network – 22 via Aircon, 21 with Collins, and 24 with Univac – make the network "one of the largest in the world for commercial use." He also noted that the Aircon contract is "one of the largest contracts ever placed for the RCA Globcom system."

The worldwide network will be in full operation in February 1971.

Venture Capital Awards Given To 2 DP Firms

BOSTON – Two fast-growing computer-oriented small businesses have captured 1970 National Venture Capital Awards, presented by the National Venture Capital Foundation.

Award winning GTS Corp., New Orleans, La., specializes in translating recordings and data on seisograms and oil well logs to magnetic tape.

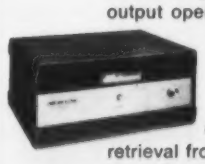
GTS was backed by Royal Street Investment Corp., New Orleans.

The second winner was Iomec, Inc., Santa Clara, Calif.

Iomec is a developer, manufacturer and marketer of a line of low cost disk data storage devices. Iomec has an estimated $10 million backlog of orders and expects to ship in excess of $7 million before the end of 1970.

Iomec was backed by Data Science Ventures, Princeton, N.J.; Hornblower & Weeks-Hemphill Noyes Co.; EDP Resources; Venrock Associates (Rockefeller Family), N.Y.; Arthur Rock & Co., San Francisco: and Max Palevsky & Associates, Los Angeles.

Which would you rather have?
Fast drop in loading . . . or 15 minutes of agony?



Economics requires efficiency at low cost. Take a look at a Tennecomp TP-1351 magnetic tape unit and matching interface in action. It's designed to eliminate almost all paper tape input/output operations. While increasing the speed of program assembly, loading, data storage and retrieval from 10 to 20 times. TP-1351 stores up to 256,000 words on a 4-track continuous-loop cartridge that also eliminates handling problems common to paper tape. That's efficiency. For the low price of a TP-1351 you can't afford not to use magnetic tape with your mini-computer. All for under $2,000. That's economics. Write or call for complete information on the Tennecomp TP-1351 Magnetic Tape Unit and other peripheral computer products.

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V-M Introduces Cassette Drive As 1st Peripheral

BENTON HARBOR, Mich. – V-M Corp., a company well-known in the field of consumer audio products, has recently introduced its first computer peripheral, a tape cassette drive for the OEM market.

The drive is available in two models, the 1602 with one-direction read/write capability, and the 1622 with bidirectional read-write.

Both models are designed to be used with certified Philips-type cassettes, with drop-in loading. The read/write head of both units is the half-track type. Optionally, other currently available heads for cassette use can be accommodated.

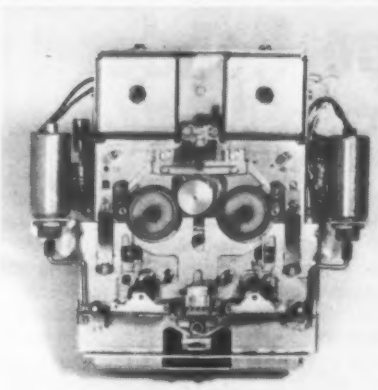
The 1602 tape is single-capstan driven with solenoid actuation of the pressure roller and clutch system. The 1622 uses dual capstans driven by two motors. The solenoid actuation is said to make possible instant start-stop of tape motion.

Tape speed is 1-7/8 in./sec, regulated electronically to within ±3%, with the tape head engaged. Fast wind, in either direction, takes approximately 75 sec for 323 ft (90 meters) of tape. Tape heads are retracted during fast wind.

The motor on the 1602 uses 7-1/2 Vdc at 75 ma in the read/write mode, 135 ma in fast wind. The 1622 uses two motors, rated at 7-1/2 V dc, requiring 150 ma in the read/write mode and 210 ma in fast wind.

The start-stop solenoids on the 1602 require 24 Vdc at 200 ma to stop tape travel, with a holding voltage of 10V at 60 ma. The two 1622 solenoids use 20V power at 200 ma for each solenoid to stop tape travel and 6-8V each at 60 ma as holding voltage.

A start-stop time of 50 msec is claimed for both models. Both models offer a tape motion sensor as optional equipment. The 1602, in addition, offers an option "cassette in place" sensor.



1622 Series Tape Drive

Both devices are currently in production and available in six to seven weeks ARO. The 1602's prices vary from $40 to $25, depending on the quantity ordered. The bidirectional 1622 is priced from $76 to $38.

The address of V-M Corp. is P.O. Box 659.

Texas Instruments X-Y Recorder Handles Six Different Signals

HOUSTON – As many as six different signals (five X, one Y) may be recorded at the same time on an X-Y recorder designed for industrial applications by Texas Instruments, Inc. (TI).

Housed in a metal case and designed for either bench, rack, or panel mounting, the "contour/riter II" recorder is available with one, two, three, or four overlapping pens, or with dual charts up to five pens. It is described by TI as a "profiling recorder," suited to unattended recording of process runs, experimental or production testing, and analog tracing of computer results.

Automatic reframing and two-color inking systems are available. Mounting may be in standard 19-in. racks or a carrying handle and mar-proof feet may be supplied.

Width of the X-axis frame is 9.75-in. in the single-chart configuration and 4.5-in. each with dual charts. The standard Y-axis length is 12-in., with special frame lengths to 24-in. available. A single roll of chart paper, TI said, will supply as many as 100 standard X-Y frames.

Specifications for the countour/riter II recorder, according to TI, include accuracy of .25%. On the X axis, span step response times of 0.4, 1, 5, 10, or 24 sec and frequency response of 5 Hz at 10% amplitude for the .4 sec models and 2 Hz at 10% amplitude for the one-second models are available. On the Y-axis, chart span step response time is 3, 5, 10, or 24 sec. Linearity on both axes is ±.1% of full scale, with deadband less than .1% of full scale.

The single pen model is priced at $2,240, with delivery 45 days ARO.

The mailing address of Texas Instruments, Inc. is P.O. Box 66027, Houston, Texas 77006.

Sanders Light Sensor Has Detector Module

NASHUA, N.H. – A light sensor that is .5 in. in diameter and weighs less than 1.5 oz meets military specifications, according to the manufacturer, Sanders Associates, Inc.

The MPT Photopen features thin film techniques that are said to combine a silicon photocell, wide bandwidth amplifier and threshhold logic.

The sensor uses a high-sensitivity detector module and provides a spectral response range of 4,000Å to 7,000Å. Designed to be used with a variety of CRT displays to perform character identification, vector generation or location, the light pen features two pressure sensitive switches with external logic outputs. The two switches are said to enable an operator to generate a vector and position it without removing the barrel from the CRT, and eliminate the need for external switching.

The unit can be operated with P-4 and P-31 phosphors with output peaks near 5,500 Å, according to Sanders. It was developed for high-sensitivity at 4,500 Å and can be used with P-7 phosphors at minimum brightness levels, the company said.

The MPT features typical radiant sensitivity for P-7 phosphors excited by 1.5 μsec pulses at 30 Hz, 17 mil diameter and spot sensitivity of .1 lambert. Input to output delay is given as two μsec, maximum, at .1 lamberts.

The price of the MPT Photopen is $1,800, in quantities of one to 10. In quantities of 25, the price drops to $1,680. The unit is currently available.

Sanders Associates, Inc. is on the Daniel Webster Hwy.

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KDI Photoelectric Paper Tape Reader Said to Scan All Standard Formats

NORRISTOWN, Pa. – A photoelectric paper tape reader from KDI Navcor, Inc. is claimed to be the first such device that reliably reads all standard tape formats at speeds up to 60 char/sec without adjustment.

The Model 1240, intended for use by the OEM, is described by the company as being ideally suited for applications in digital systems, data terminals, automatic test systems, business machines, graphic arts equipment, machine tool control, and data communications equipment.

Drive Reliability

Reliability of the drive is said to be enchanced by having the entire mechanism at rest during tape advance with only the lamps using power. Selfcontained drive electronics and signal conditioning system are said to supply clean integrated circuit data output with no bounce or contact problems. The tape advance command can come directly from standard ICs without special drive requirements, the company said.

The tape can be advanced in an asynchronous manner up to 60 char/sec. The unit requires two voltages: +5 Vdc for lamps and logic, and a nominal 24 Vdc for solenoid drive. Circuits compensate the lamps and solenoid to the voltage supplied.

The tape reading is done by long-life bulbs and miniature photo transistors. When a hole in the tape appears between the lamps and the transistor, the lamp switches on to provide the data output. This raw output is amplified to make the data lines compatible with IC drive and loading.

The use of only one tape latch and guide is said to make tape handling easier. The sprocket/roller design is said to minimize tape wear and enable it to handle all standard tape material, widths and center or advanced feed sprockets without adjustment.

The 1240 can operate in temperatures that vary from +32° F to +140° F, and in humidity varying from 10% to 90%.

The price of the Model 1240 Paper Tape Reader is $350 in quantities 1 to 9. OEM discounts are available; for example, the price for quantities of 200 is under $250. The company is currently in prototype delivery. Under current production schedules, the unit will be available from stock, in small quantities, in October 1970.

KDI Navcor, Inc. is in the Valley Forge Industrial Park.

You've gone computer. You've given it a good try. Now you're disenchanted. You're unhappy about the costs/results ratio.

You've also got lots of company.

If yours is a typical situation, it's the most common problem in data processing – and the problem is *not* the computer.

The bind comes with the excessively high cost of data capture and control: input preparation. And perhaps worst of all, those high costs discourage the implementation of many useful programs. So full use of the computer isn't even being made. (It's like keeping a fine car in the garage because the fuel is too expensive.)

But the gathering of data for computer processing need not be costly or complicated.

With the Addo-X system, data is prepared automatically, in computer-acceptable form, *as a by-product* of normal accounting, reporting, and record-keeping operations. Keypunching is eliminated (count *those* savings for openers). So are error-correction and data-verification costs.

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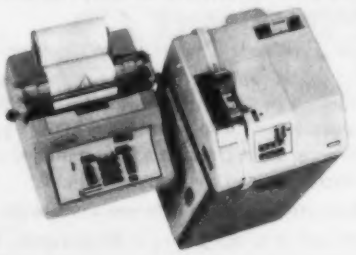

And no errors – because this is a *programmable* method. Procedural errors are impossible; they're actually caught before they happen. (If the operator makes a mistake in the assigned procedure the machine simply locks. No entry, thus no error.)

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Addo-X, Inc., ADP Division, 437 Madison Avenue, New York, N.Y. 10022 • (212) 758-9171.

ADDO-X

If your computer looks like a lousy investment, don't blame your computer.

Your data preparation methods are probably obsolete.

Regional headquarters: 6549 W. North Ave., Oak Park, Illinois 60302/3339 Temple St., Los Angeles, Calif. 90026

Order and Installations

Midland Data Processing Division of Midland National Bank, Milwaukee, has ordered a Burroughs B4504 system valued at $1.3 million. Projected applications of the system are on-line order entry, payroll, accounts payable and general ledger.

NCR Century 100 systems have been ordered by Kraco Products, Inc. of Compton, Calif. to process bills of lading, measure aging of accounts receivable, and to keep track of daily production and stock; by Pride Refining Co. of Abilene, Texas, to handle its general ledger, accounts receivable and payable, and to process payroll; and by six former Fort Benning soliders at Columbus, Ga., who have organized a new data center which will offer various accounting services, including billing and property management for area real estate firms.

The city of Columbia, S.C., has installed a Burroughs B500 system, valued at more than $430,000 for use in the water department billing, collection and analysis; parking ticket enforcement, police court docket and traffic division statistical analysis.

Lincoln First Bank, Rochester, N.Y., has ordered two IBM 370/155s to be used in handling transactions on savings and checking accounts, loans, and credit card services.

Honeywell has announced the installation of computer systems by the following educational institutions: a Model 115 by the Andover Institute of Business, Andover, Mass., for education applications; a Model 110 magnetic tape-disk system by Cambrian College, North Bay, Ontario, Canada, for instruction in data processing and for administrative applications such as student scheduling and record maintenance; and a Model 1200 tape-disk system by Dearborn Public Schools, Dearborn, Mich., for business and school services for the school district, including student scheduling, registration and grade reporting.

Also a Model 110 magnetic tape system by Lansing Business University, Lansing, Mich., for instruction of students in data processing operations, programming and systems utilization; a Model 115 tape-disk system by Northeast Metropolitan Regional Vocational High School, Wakefield, Mass., for instruction purposes, student scheduling, budget, payroll, grade and attendance recording; and a Model 125 magnetic tape system by University College, Swansea, Bristol, England, for administration work, including student records, accounting and payroll.

Gulf Oil Co.'s Travel Card Center in Atlanta, Ga., has ordered a pair of Spectra 70/45 systems valued at more than $2 million. Computer Investments and Leasing Corp. has ordered a $2 million Spectra 70/60 remote computing system for its data services center in Haddonfield, N.J.

The First National Bank of Indiana, Pa., has announced the installation of a Burroughs B340 system valued at more than $180,000. Applications for the new system include checking accounts, proof and transit, Golden Passbook, stockholder accounting, and account reconciliation.

AiResearch Manufacturing Co., Phoenix, Ariz., has installed a Control Data 6400 system valued at $2.8 million to aid its aerospace engineering research and design activities.

Bundeslanderversicherung, an insurance company in Vienna, Austria, has ordered a Univac 1106 computer system valued at about $3 million. The system will be used for the rapid retrieval of data concerning insurance contracts, for information on injuries filed by agents, for contract processing and control, for statistical information and various mathematical tasks.

Protestors Focusing on Honeywell

WILMINGTON, Del. – Antiwar and "anticapitalist" protestors are zeroing in on Honeywell's stockholders meeting Sept. 18 to approve the merger of GE's and Honeywell's computer operations.

A spokesman for the "Honeywell Project," whose members disrupted the last Honeywell stockholders meeting [CW, May 18], said that the group's activities would be peaceful.

The group plans a rally and picket line outside the meeting, and will have stockholders inside the meeting.

The Honeywell Project is trying to force Honeywell to end all military production, and to convert to civilian work so that no one loses his job.

The Project also wants Honeywell to turn control of the company over to the employees. Stockholders at the meeting will try to have these demands considered.

Gross Income

Honeywell's gross income from military work was $480 million last year, 35% of the total gross. The estimated gross income of the merged computer operation is about $350 million.

The Honeywell Project began two years ago as an attempt to convince the Honeywell Board of Directors to end military work.

Tab Forecasts per Share Earnings Of 25 to 30 Cents for 1st Quarter

PALO ALTO, Calif. – Harry W. LeClaire, Tab Products Co. president, said recently that his company expects to report per share earnings "of 25 to 30 cents" for its first quarter, which ended Aug. 31, 1970

LeClaire told shareholders attending the firm's annual meeting in Palo Alto that price increases effective in April, combined with the discontinuance of a data input center operation that lost money last year, were primary reasons for the improvement.

The first quarter benefitted "to some degree" from shipments delayed as a result of the Chicago truck strike.

"The held-over shipments were a factor, but they are not fundamental to the improvement we anticipated for the first quarter, or for the balance of the year," LaClaire said.

The company is developing several new products and LeClaire expects them "to contribute some revenue in the third quarter.

Mohawk Data per Share Earnings Rise, Revenues for Fiscal Year Increase 24%

HERKIMER, N.Y. – Mohawk Data Sciences Corp. earned $1.52 per share on total revenues of $102,550,000 for the year ended July 31.

These represent increases of 32% and 24%, respectively, over the $1.15 per share and $83 million reported by the concern in fiscal 1969. The earnings per share for fiscal 1969 exclude extraordinary credits from the utilization of income tax loss-carryforwards of 7 cents per share; extraordinary items in fiscal 1970 were offsetting and, therefore, had no effect upon earnings per share.

Richard P. Rifenburgh, president of MDS, stated: "We are proud of the company's fiscal 1970 performance, especially in view of conditions in the U.S. economy and the computer industry during the period. Total revenues topped the $100 million mark for the first time in its six-year history, and income from equipment rentals and services expanded by approximately 75% to $38.2 million. Revenues in fiscal 1970 include $4 million from the sale of rental equipment to third party concerns.

"Nevertheless," he continued, "MDS did not escape the effects of the economic slowdown, as evidenced by the decline in backlog statistics for end user and OEM equipments over the last 12 months. While the backlog of orders from original equipment manufacturers (OEM) declined by $3,250,000 in the fourth fiscal quarter due largely to cutbacks by NCR, the end-user backlog stabilized at $28 million during the final quarter of the year."

Finance

Anderson Jacobson Gets Computer Equities in Deal

SUNNYVALE, Calif. – Anderson Jacobson, Inc. has acquired Computer Equities, Inc., a Delaware corporation in Houston. The acquisition was made on an exchange of stock basis, and completed on Aug. 31.

Computer Equities was formerly wholly owned by Computer Complex, Inc., also of Houston, and is engaged in the business of leasing computer peripheral equipment, principally to users of computer time-sharing.

Marketing Posture

Raymond E. Jacobson, president of AJ, stated that this acquisition will strengthen AJ's marketing posture in the computer time-sharing terminal leasing business. He said that Computer Equities will provide a basis for leasing remote data terminals of AJ manufacture to AJ's time-sharing customers. AJ designs, manufactures, sells, and leases computer time-sharing terminals, modems, data couplers, and magnetic tape devices.

Hardware Leasing

Robert Westerhouse, president of Computer Complex, stated that the sale of Computer Equities to AJ was made to further the Computer Complex' planned effort to divest itself of hardware leasing activity.

Computer Complex provides time-shared computer service throughout the country.

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Unaffected by Slump

C&S, Scientific Software Earnings, Sales Up

The present economic slump apparently isn't all that bad for two software firms. The companies, Computing and Software, Inc. and Scientific Software Corp., have reported substantial increases in earnings and sales during their current fiscal year.

Showing record earnings and revenue during the first nine months of fiscal 1970, Computing and Software, Inc. of Los Angeles reported a net income of $4,468,000 on sales of $60,104,000. This compares to year-earlier figures of $3,354,000 net income on sales of $54,616,000.

Norman E. Friedmann, C & S chairman and president, said the earnings of 91 cents a share represented a 30% increase over the 70 cents a year ago. The chief executive also stated the firm's principal business endeavor, the sale of business information, exhibited internal growth and enlarged profits, and that C & S had more than doubled the number of data center centers and information files it had a year ago.

Scientific Software Corp., a Denver-based organization which develops and markets proprietary software for the petroleum, mining, financial and publishing industries, reported a net profit of $14,410, or one cent per share of common stock, for the six-month period ending July 31, 1970.

The same period in fiscal 1960 showed a loss of $137,729, or 14 cents a share.

Announcing the net increase in first half earnings, Dr. E. Allen Breitenbach, company president, pointed out that for the last full fiscal year, ending Jan. 31, 1970, Scientific Software Corp. showed a net loss, after adjustments, of $219,000, or 22 cents a share.

Reviewing corporate development, Breitenbach stressed that his firm's strategy is to concentrate, for the present, on "building foundations for future growth, expanding professional and technical staffs, broadening inventory of marketable proprietary products, and enlarging consulting activities and data processing services."

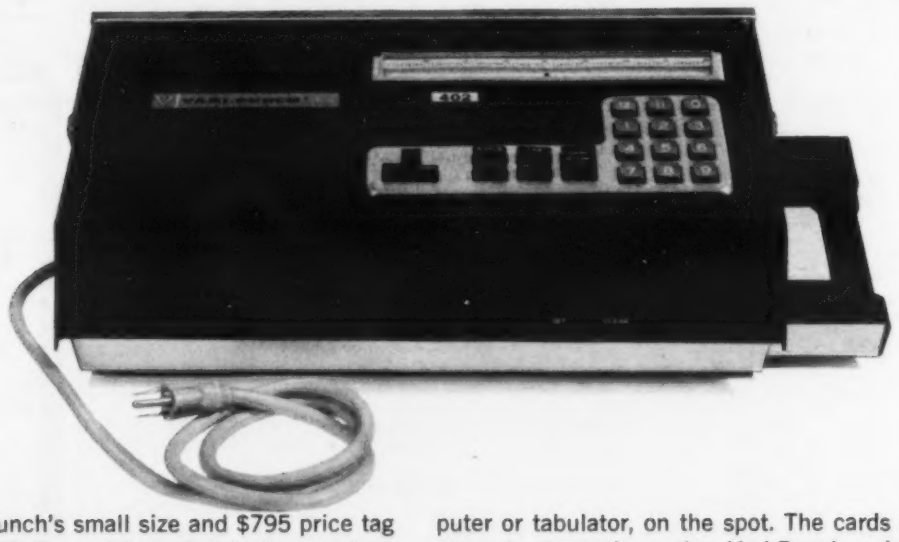
Tracor Announces Plan For Datamark Acquisition

AUSTIN, Texas – Tracor, Inc., a maker of computer peripherals, has announced an agreement in principle to acquire Datamark, Inc., a Westbury, Long Island-based manufacturer of medium and high-speed line printers.

Richard N. Lane, Tracor board chairman, said the acquisition would be made for an undisclosed amount of Tracor common stock and that Datamark would become a part of Tracor Data Systems, Tracor's computer hardware subsidiary.

The proposed acquisition, subject to approval of Datamark shareholders, will strengthen the line of peripherals the subsidiary is developing.

At last–a practical solution to central keypunch errors, work backlogs and peak loads



Don't let Vari-Punch's small size and $795 price tag fool you. This 15 lb. portable electric keypunch is making a very big contribution to EDP efficiency in many different businesses.

The Model 402 Vari-Punch records source data directly to punched cards at the point of origin. Vari-Punched cards arrive in the computer room ready for processing. You bypass the keypunch department and its problems.

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The electric Vari-Punch makes the promise of decentralized keypunching a reality. Mail the coupon below for complete information.

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IS the international marketplace the key to success in the computer industry at a time when things aren't going so well here at home?

The current Gray Sheet probes this concept as it examines the world of the computer outside the U.S. Send for the current issue -- $8. Or, go ahead. A year's supply only costs $75.

EIDP industry report
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TRADE*QUOTES

Computerworld Stock Trading Summary

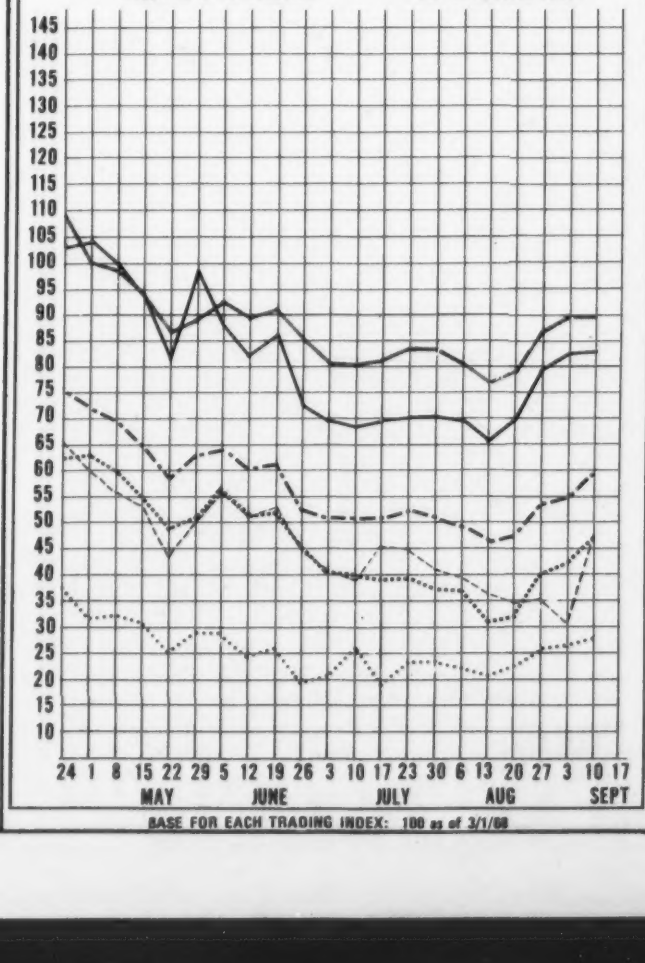
All statistics compiled, computed and formatted by TRADE*QUOTES Division of National Information Services, Inc. Cambridge, Mass. 02139

CLOSING PRICES THURSDAY, SEPTEMBER 10, 1970

EXCH		1970 RANGE (1)	CLOSE SEP 10 1970	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 6	3 1/2	0	0.0
A	APPLIED DATA RES.	4- 24	6	- 1/4	-4.0
O	APPLIED LOGIC	2- 19	3	0	0.0
O	ARIES	1- 8	1 3/8	+ 1/8	+10.0
A	AUTOMATIC DATA PROC	23- 47	35 3/8	- 1/2	-1.3
O	AUTO SCIENCES	3- 14	4	0	0.0
O	BRANDON APPLIED SYS	1- 9	1	0	0.0
O	COMPUTER AGE INDUS.	1- 3	1 3/4	+ 1/2	+40.0
A	COMPUTER APPL	2- 12	2 3/8	0	0.0
O	COMPUTER ENVIRON	3- 14	3	+ 1/8	+4.3
O	COMPUTER INDUS.	2- 10	5	+1	+25.0
O	COMPUTER NETWORK	3- 14	5 1/4	-2 3/4	-34.3
O	COMPUTER PROPERTY	5- 15	6	+ 1/4	+4.3
N	COMPUTER SCIENCES	6- 34	12 7/8	+3 3/4	+41.0
O	COMPUTER USAGE	2- 8	3 1/8	+ 5/8	+25.0
A	COMPUTING & SOFTWARE	16- 75	26	+2 1/4	+9.4
O	COMRESS	2- 10	2 3/8	+ 3/8	+18.7
O	COMSHARE	3- 15	2 7/8	- 1/8	-4.1
O	CONSOL. ANAL. CENT.	1- 3	1 1/4	+ 1/2	+66.6
O	DATA AUTOMATION	1- 24	2 3/4	+ 1/2	+22.2
O	DATA PACKAGING	5- 29	7 3/4	- 1/4	-3.1
O	DATAMATION SERVICE	1- 6	1 1/4	- 3/8	-23.0
O	DATATAB	5- 9	4 3/4	- 1/8	-2.5
O	DIGITEK	2- 5	1 3/4	0	0.0
O	EDP RESOURCES	5- 13	5 3/4	- 1/4	-4.1
A	ELECT COMP PROG	3- 11	3 1/2	0	0.0
O	ELECTRONIC DATA SYS.	31-161	51	+2 1/2	+5.1
O	INFORMATICS	4- 21	6 1/8	+ 1/8	+2.0
A	ITEL	6- 26	10	- 3/8	-3.6
O	LEVIN-TOWNSEND SERV.	1- 13	5	+ 1/2	+11.1
A	MANAGEMENT DATA	8- 25	10 3/4	+ 3/4	+7.5
O	NAT COMP ANALYSTS	1- 8	3 1/2	+ 1/8	+3.7
O	NAT.COMP. SERV.	3- 12	4 3/4	0	0.0
N	PLANNING RESEARCH	13- 54	22 1/4	+2 1/4	+11.2
O	PROGRAMMING METHODS	9- 27	13 1/2	+ 1/2	+3.8
O	PROGRAMMING & SYS	2- 5	2 7/8	0	0.0
O	PROGRAMMING SCIENCES	2- 33	2 1/2	+ 3/8	+17.6
N	SCIENTIFIC RESOURCES	2- 22	3 1/4	- 1/8	-3.7
O	SOFTWARE SYSTEMS	1- 2	5/8	- 1/8	-16.6
O	TBS COMPUTER CENTERS	5- 27	4 1/2	-1 1/2	-25.0
O	UNITED DATA CENTER	2- 4	2 5/8	+ 1/8	+5.0
N	UNIVERSITY COMPUTING	14- 99	25 3/4	+6 3/4	+35.5
A	URS SYSTEMS	5- 21	7	+ 1/4	+3.7
O	U.S. TIME SHARING	3- 14	5 1/4	+1 3/4	+50.0
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	21- 62	31 3/8	-1	-3.0
O	ALPHANUMERIC	2- 15	3	- 1/8	-4.0
N	AMPEX CORP	13- 48	18 1/2	+1 7/8	+11.2
A	ASTRODATA	4- 34	7 1/8	+2 3/8	+50.0
O	BOLT,BERANEK & NEW	3- 11	7 5/8	+1 1/8	+17.3
N	BUNKER-RAMO	6- 14	8 3/4	+ 5/8	+7.6
A	CALCOMP	11- 33	16	- 1/8	-0.7
O	COGNITRONICS	3- 13	3 7/8	+ 1/8	+3.3
O	COLORADO INSTRUMENTS	4- 13	7 3/8	+ 5/8	+9.2
O	COMPUTER COMMUN.	5- 36	8 1/2	+ 1/2	+6.2
A	COMPUTER EQUIPMENT	4- 12	4 7/8	+1	+25.8
A	COMPUTEST	14- 28	17 1/8	+ 7/8	+5.3
A	DATA PRODUCTS CORP	5- 26	8 7/8	+ 3/4	+9.2
O	DATA TECHNOLOGY	5- 23	5	- 1/4	-4.7
O	DIGITRONICS	4- 13	5	+ 3/4	+17.6
N	ELECTRONIC M & M	7- 40	12 1/4	+2 3/8	+24.0
O	FABRI-TEK	3- 8	3 7/8	+ 1/2	+14.8
O	FARRINGTON MFG	2- 17	2 1/2	+ 1/8	+5.2
O	INFORMATION DISPLAYS	5- 20	5	- 1/4	-4.7
A	MARSHALL INDUSTRIES	14- 67	22 1/8	-1 1/4	-5.3
A	MILGO ELECTRONICS	15- 42	25 1/8	+2 1/4	+9.8
N	MOHAWK DATA SCI	19- 87	34 1/8	+4 7/8	+16.6
O	OPTICAL SCANNING	11- 52	21 1/2	+ 1/2	+2.3
O	PHOTON	4- 17	9 5/8	+ 5/8	+6.9
O	PHOTO-MAGNETIC SYS.	1- 4	1 1/4	- 1/4	-16.6
A	POTTER INSTRUMENT	15- 42	23 1/2	+2 3/8	+11.2
O	PRECISION INST.	6- 25	8	+1 1/4	+18.5
O	RECOGNITION EQUIP	13- 83	19 3/4	+1 3/4	+9.7
O	REDCOR CORP.	4- 34	7 5/8	+1 1/8	+17.3
N	SANDERS ASSOCIATES	7- 29	12 3/4	+ 3/4	+6.2
O	SCAN DATA	6- 53	6 1/2	+ 1/4	+4.0
O	TALLY CORP.	10- 23	14	+1	+7.6
N	TELEX	10- 25	14 7/8	+2	+15.5
O	VIATRON	2- 51	4 3/4	+2 1/4	+90.0
	SUPPLIES & ACCESSORIES				
N	ADAMS-MILLIS CORP	8- 15	12 1/4	+ 5/8	+5.3
O	BALTIMORE BUS FORMS	11- 21	10 3/4	- 1/4	-2.2
A	BARRY WRIGHT	6- 25	10	+1 7/8	+23.0
A	DATA DOCUMENTS	15- 35	17 5/8	- 3/8	-2.0
N	ENNIS BUS. FORMS	11- 19	12	-1 3/4	-12.7
O	GRAHAM MAGNETICS	5- 7	6	0	0.0
O	GRAPHIC CONTROLS	7- 17	7	- 1/8	-1.7
N	MEMOREX	46-166	78 1/4	+5 3/4	+7.9
N	3M COMPANTY	71-114	85 5/8	+ 5/8	+0.7
O	MOORE BUS. FORMS	27- 38	31 5/8	- 1/8	-0.3
N	NASHUA CORP	21- 43	30 3/8	+3 3/8	+12.5
O	REYNOLDS & REYNOLD	25- 48	30	+1	+3.4
O	STANDARD REGISTER	17- 30	19 1/4	-1	-4.9
N	UARCO	22- 39	27	+1 1/2	+5.8
A	WABASH MAGNETICS	7- 30	10 3/8	+ 3/4	+7.7
O	WALLACE BUS FORMS	25- 41	34	-2 1/4	-6.2
N	BURROUGHS CORP	78-173	105 3/8	-6 5/8	-5.9
N	COLLINS RADIO	9- 37	13 1/4	0	0.0
N	CONTROL DATA CORP	30-122	40 3/8	- 3/4	-1.8
A	DIGITAL EQUIPMENT	50-124	74	-1	-1.3
N	ELECTRONIC ASSOC.	3- 11	5 5/8	+ 7/8	+18.4
A	ELECTRONIC ENGINEER.	3- 14	4 3/8	- 1/4	-5.4
N	FOXBORO	18- 35	24 1/8	+1 3/8	+6.0
O	GENERAL AUTOMATION	9- 42	12	0	0.0
N	GENERAL ELECTRIC	60- 80	80	+1 1/4	+1.5
N	HEWLETT-PACKARD CO	19- 45	26	+1 3/4	+7.2
N	HONEYWELL INC	65-152	88 3/4	+1 3/8	+1.5
N	IBM	223-387	268 1/4	-1 1/2	-0.5
N	NCR	30- 86	37 3/4	- 1/8	-0.3
N	RCA	18- 34	26 1/2	+1 3/4	+7.0
N	RAYTHEON CO	16- 33	22 5/8	+2 1/8	+10.3
O	SCI. CONTROL CORP.	1- 8	2	+ 1/8	+6.6
N	SPERRY RAND	19- 40	24 1/8	+ 1/2	+2.1
A	SYSTEMS ENG. LABS	10- 49	16 5/8	+1 1/4	+8.1
N	VARIAN ASSOCIATES	9- 29	16 1/8	+2 5/8	+19.4
A	WANG LABS.	18- 52	32 3/4	+3 1/4	+11.0
N	XEROX CORP	66-115	78	-2 1/4	-2.8
	LEASING COMPANIES				
O	BOOTHE COMPUTER	8- 25	11 7/8	+ 3/4	+6.7
O	BRESNAHAN COMP.	3- 9	3 5/8	+ 3/8	+11.5
O	COMPUTER EXCHANGE	2- 8	5 3/8	- 1/8	-2.2
O	COMPUTER LEASING	3- 18	3	+ 1/2	+20.0
N	DATA PROC. F & G	6- 32	12 5/8	+ 5/8	+5.2
O	DATRONIC RENTAL	2- 8	2 1/2	- 1/4	-9.0
A	DEARBORN COMPUTER	10- 24	18 3/4	+1 1/8	+6.3
O	DIEBOLD COMP. LEAS.	2- 8	3 7/8	- 1/8	-3.1
A	DPA, INC.	3- 10	4 1/4	+ 1/8	+3.0
A	GRANITE MGT	7- 22	10 1/8	- 5/8	-5.8
A	GREYHOUND COMPUTER	5- 44	8 7/8	+1 5/8	+22.4
N	LEASCO DATA PROC.	7- 30	11	- 1/2	-4.3
O	LECTRO COMP LEAS	2- 9	2 1/4	- 1/4	-10.0
A	LEVIN-TOWNSEND CMP	3- 19	5 1/4	- 1/8	-2.3
O	LMC DATA, INC.	1- 3	1 1/4	0	0.0
O	MANAGEMENT ASSIST	1- 4	1 5/8	0	0.0
O	NCC INDUSTRIES	3- 8	4 7/8	+ 1/4	+5.4
O	SYSTEMS CAPITAL	1- 8	2 1/8	+ 5/8	+41.6
A	U.S. LEASING	3- 19	13 3/4	+ 5/8	+4.7

EXCH: N=NEW YORK EXCHANGE; A=AMERICAN EXCHANGE
L=NATIONAL EXCHANGE; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Computer Stocks Trading Index



BASE FOR EACH TRADING INDEX: 100 as of 3/1/68

Earnings Reports

DATRONIC RENTAL CORP.
Year Ended June 30

	1970	1969
Shr Ernd	$.36	$.44
Revenue	3,091,099	2,779,211
Earnings	244,349	259,956

COMPUTER TECHNOLOGY INC.
Three Months Ended June 30

	1970	1969
Shr Ernd	.....	$.05
Revenue	$9,415,000	6,889,000
Spec Chg	b1,246,000	.....
Earnings (Loss)	(3,937,000)	297,000
6 Mo Shr	.....	.12
Revenue	19,102,000	14,294,000
Spec Chg	b1,246,000	.....
Earnings (Loss)	(4,603,000)	689,000

a-Restated to exclude operating results of Service Technology Corp. which was sold in March, 1970. b-Write-off of deferred start-up costs plus costs of leasehold improvements.

MEMOREX CORP.
Six Months Ended June 30

	1970	1969
Shr Ernd	$1.04	$.83
Revenue	47,704,000	35,703,000
Earnings	3,884,000	3,073,000

ELECTRONIC DATA SYSTEMS
Year Ended June 30

	1970	1969
Shr Ernd	$.61	$.30
Revenue	47,617,009	16,431,765
Earnings	7,214,126	3,426,433

UNIVERSITY COMPUTING CORP.
Three Months Ended June 30

	1970	a1969
Shr Ernd	$.24	$.59
Revenue	31,979,000	23,672,000
Earnings	1,689,000	3,899,000
6 Mo Shr	.85	1.15
Revenue	69,154,000	42,534,000
Earnings	5,895,000	7,589,000

a-Restated by company.

ASTRODATA INC.
Three Months Ended June 26

	1970	1969
Shr Ernd	.....	a$.05
Revenue	$3,301,000	5,008,000
Tax Cred	.....	118,000
Earnings (Loss)	(882,000)	b223,000

a-Based on income before tax credit. b-Equal to 10 cents a share.

GREYHOUND COMPUTER CORP.
Three Months Ended June 30

	1970	1969
Shr Ernd	$.20	$.30
Revenue	12,382,000	12,490,000
Earnings	881,000	1,318,000
6 Mo Shr	.40	.60
Revenue	24,765,000	24,351,000
Earnings	1,739,000	2,599,000

PHOTON INC.
Six Months Ended June 30

	1970	1969
Shr Ernd	$.15	$.13
Revenue	10,175,507	8,901,813
Earnings	580,073	521,289

1970 results do not include income from the March 11, 1970 patent suit settlement with Eltra Corp. in total amount of $2.5 million, of which Photon receives $1 million in 1970 and the remainder in six equal annual payments.

DATA PROCESSING FINANCIAL & GENERAL
Year Ended May 31

	1970	1969
aShr Ernd	$.64	$2.43
Revenue	49,387,785	37,625,108
bNet Cont Op	7,165,775	8,159,611
Disc Op (Loss)	(4,783,372)	16,043
Spec Chg	6,637,996	.....
Earnings (Loss)	(4,255,593)	8,175,654

a-Based on income before special charges. b-Equal to $1.92 a share in 1970 and $2.42 a share in 1969.

MOHAWK DATA SCIENCES
Year Ended July 31

	1970	1969
Shr Ernd	$1.52	a$1.15
Revenue	102,550,000	83,000,000
Spec Cred	.....	b400,000
Earnings	8,325,000	c6,650,000

a-Based on income before special credit. b-From tax loss carry-forwards. c-Equal to $1.22 a share.

CLARY CORP.
Three Months Ended June 30

	1970	1969
Revenue	$2,544,000	$2,696,000
aSpec Chgs	278,000	70,000
Loss	451,000	397,000
6 Mo Rev	4,582,000	4,893,000
aSpec Chgs	364,000	127,000
Loss	721,000	443,000

a-Nonrecurring charges related to discontinued computer operations and from write-off of assets dependent on continuation of government contracts in 1970 and 1969 write off of reserach and development in military programs.

MetaCOBOL	COBOL
PRINT BODY BY 2.	WRITE BODY AFTER ADVANCING 2 LINES. MOVE SPACES TO BODY. ADD 2 TO LINE-COUNT. IF LINE-COUNT IS GREATER THAN 56 PERFORM PAGE-HEADING-ROUTINE MOVE ZEROS TO LINE-COUNT.
CLEAR WORK-RECORD.	MOVE SPACES TO WORK-RECORD. MOVE ZEROS TO AMOUNT OF WORK-RECORD. MOVE ZEROS TO HOURS OF WORK-RECORD. MOVE ZEROS TO RATE OF WORK-RECORD.
CANJOB THREE.	ENTER LINKAGE. CALL 'CANJOB' USING THREE. ENTER COBOL. STOP RUN.
INPUT-FROM CARDS-IN INTO CARD-IN.	OPEN INPUT CARDS-IN. PERFORM ZZ-INIT-ZZ. GO TO ZZ-OPEN-ZZ. ZZ-READ-ZZ. IF ZZ-LR-ZZ = 'N' CLOSE CARDS-IN STOP RUN. READ CARDS-IN AT END MOVE 'N' TO ZZ-LR-ZZ. GO TO ZZ-BREAK-ON-ZZ.
LISEZ LA-CARTE, A LA FIN ALLEZ A SORTIE. MULTIPLIEZ LES-HEURES PAR LE-TAUX POUR DONNER LE-SALAIRE. DEPLACEZ PIERRE A COLETTE.	READ LA-CARTE, AT END GO TO SORTIE. MULTIPLY LES-HEURES BY LE-TAUX GIVING LE-SALAIRE. MOVE PIERRE TO COLETTE.
01 TRAN-SORT-KEY. 02 SEQ-KEY. 03 ACCT. 04 ACCT-KEY. 05 ACCT-NO P=X(10).	01 TRAN-SORT-KEY. 02 SEQ-KEY. 03 ACCT. 04 ACCT-KEY. 05 ACCT-NO PICTURE IS X(10).

MetaCOBOL™

A macro statement facility designed for peaceful coexistence with COBOL

The limitations of COBOL are well-known to anyone who works extensively with it. Rigid syntax; the frequent need for an excessive number of statements and for repetition of information common to many COBOL statements; and the general inflexibility which too often consumes valuable time for unproductive purposes, are just some of the undesirable characteristics that have been unavoidable till now.

Over the years ADR has been actively associated with the development and expansion of COBOL language and usage. Now, we have developed the logical and long needed improvement. MetaCOBOL: a unique macro statement facility to give you the best of COBOL plus the means to simplify and expand its use for your specific needs.

Here is how MetaCOBOL will function. It accepts standard COBOL and user-defined statements and transforms them into a standardized format compatible with IBM/360 Level E, Level F, and ANS COBOL. It develops and invokes macro statements embedded in COBOL programs. It abbreviates existing COBOL required words and phrases, defines new verbs, simplifies writing multi-part verbs, eliminates the need for writing extensive data name qualifications. MetaCOBOL will also produce program listings in easier to read format, define a library of standard macros and abbreviations and help in debugging. It will produce report writing, information retrieval and other generalized programs from simple parameters. It will generate test data and supply output in source form.
In total, MetaCOBOL offers a new flexibility and the opportunity to significantly reduce time and costs in COBOL programming and coding. MetaCOBOL is operational! You can write in MetaCOBOL tomorrow. Contact any ADR office today.

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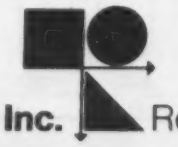

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